How Good Is

To help all students reach high standards, we need to ask what level of performance is required to be a master.

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MASTERY: An action demonstrating or involving great skill or power . . . to perform a notable deed or wonderful feat. Consummate skill, ability, or accomplishment.

MASTER: To make oneself master of, attain expertise in (an art, science, skill, etc.); to acquire complete knowledge or understanding of (a fact, subject, etc.); to attain complete facility in using (an instrument, etc.).

—*Oxford English Dictionary*, online edition

Who wouldn't consider mastery a key aim of education? We don't want barely capable learners graduating from our schools. We want students who have high-level "understanding" and "facility" in terms of key goals.

But what, precisely, is such mastery? "Great skill or power" in *what*, exactly? And, assuming we can agree on the goal, we face a second issue: What level of performance is high enough for us to say that a goal has been mastered? These are the two questions at the heart of mastery.

Alas, few educators have thought this

Good Enough?

through precisely and sufficiently, and the results have been unfortunate. Mastery has been reduced to a high score on any old quiz.

It's time to better master the idea of mastery.

Question 1: What Is Mastery?

"Consummate skill" would seem to require a complex and challenging task or two. How, then, should we define mastery—to avoid rushing into schemes that dumb down the idea?

Surprisingly, Benjamin Bloom, the founder of modern mastery learning, finessed the question. Bloom nowhere defined mastery; he only proposed that we set "absolute," criterion-referenced standards at the local level (Bloom 1968). Because Bloom offered no practical advice beyond looking to past local results to set valid standards, few schools have tried to define mastery of those standards —with unfortunate consequences. Numerous writers on and practitioners of mastery learning, for example, propose that mastery be set locally as a percentage score on *any* test. Thus, if you achieved 85 percent or 90 percent on any test of content, you would be deemed to have demonstrated mastery—no matter how picayune or low-level the test questions. As Kubina and Morrison (2000) put it,

> If experts in "mastery learning" cannot provide explicit, objective benchmarks in performance criteria that signal adeptness, who can? . . . When teachers,

districts, or even states set subjective performance standards for mastery, knowledge of effective teaching practices and student learning diminishes. (pp. 85–86)

And that's where it stands today. Many schools that call themselves mastery-based (or proficiency-based or competency-based) are using invalid and unjustified schemes for giving

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scores and accolades. Rather than designing backward by establishing complex, worthy, and valid tasks on which students must demonstrate high-level ability (Wiggins & McTighe, 2005), schools too often reduce mastery to a high grade on a simplistic and nonvalidated assessment.

The Hazards of Teaching Bit by Bit

Perhaps as a result of the lack of an overall vision for what constitutes mastery, education has a long-standing practice of turning worthy learning goals into lists of bits. One might even say that this practice is the original sin in curriculum design: Take a complex whole, divide it into small pieces, string those together in a rigid sequence of instruction and testing, and call completion of this sequence "mastery." Although well-intentioned, this practice leads to needlessly fractured, boring, and ultimately ineffective learning that never prepares students to be fluent and skilled in authentic work.

Authors of and consultants to the Common Core State Standards share my concern. The recently released *K–8 Publishers' Criteria for the*

Common Core State Standards for Mathematics (National Governors Association, Council of Chief State School Officers, Achieve, & National Association of State Boards of Education, 2013) cautions,

> A drive to break the Standards down into "microstandards" risks making the checklist mentality even worse than it is today. Microstandards would also make it easier for microtasks and microlessons to drive out extended tasks and deep learning. Finally, microstandards could allow for micromanagement: Picture teachers and students being held accountable for ever-more-discrete performances. . . . If the Standards are like a tree, then microstandards are like twigs. You can't build a tree out of twigs, but you can use twigs as kindling to burn down a tree. (p. 5)

Tom Guskey, who writes about the definition of mastery in another article in this issue, was one of Bloom's students and is a strong advocate of mastery learning. In a 2005 paper presented at the American Educational Research Association's annual meeting, Guskey noted that his mentor would never have approved of what is now being done in the name of mastery:

> Some early attempts to implement mastery learning were based on narrow and inaccurate interpretations of Bloom's ideas. These programs focused on low-level cognitive skills, attempted to break learning down into small segments, and insisted students "master" each segment before being permitted to move on. . . . Nowhere in Bloom's writing can the suggestion of this kind of narrowness and rigidity be found. (p. 8)

This concern about carving up complex work into low-level bits is actually far older—it was a focus of John Dewey's critique of curriculums 100 years ago. As Dewey (1916) notes, a frequent harmful effect of this approach is to overstress technical vocabulary in initial learning:

> Technical concepts and their definitions are introduced at the outset. Laws are introduced at an early stage, with at best a few indications of the way in which they were arrived at. . . . The pupil learns symbols without the key to their meaning. He acquires a technical body of information without ability to trace its connections [to what] is familiar—often he acquires simply a vocabulary. (p. 220)

In other words, once we decide on breaking a complex performance into bits, we end up wrongly

defining mastery as recall of vocabulary terms and isolated facts instead of any "facility or power," to return to the *Oxford English Dictionary* definition.

Here is a revealing modern example of what Dewey feared, from a current middle school science book titled *Sound and Light* (Prentice Hall, 2005). By page 12, the following terms have been introduced to discuss waves—without any prior observations or experiments, just graphics: *transverse, mechanical, troughs, longitudinal, compressions, rarefactions, amplitude, wavelength, frequency*. The chapter ends with three formulas out of context. The chapter assessment? Recall the terms and plug some data into the formulas, of course!

Sadly, lessons and tests like this are ubiquitous in schools generally, and in so-called mastery programs in particular. Indeed, many modern software solutions now exist to help educators track endless small objectives, in the name of "mastery," "proficiency," or "competency." In some units, students cannot advance to the next level until they test out on interim assessments of such bits of knowledge.

That's not only unwise pedagogically, but also immoral. Lots of great achievers might have been either unable or unwilling to first master a long list of words and worksheets, in isolation, before doing something more worthy. It's as foolish and harmful as not allowing a young would-be basketball player to actually play games until he or she scores 90 percent or better on 20 paper-and-pencil quizzes on the sport.

The practice of reducing mastery to accurate recall of discrete facts and skills is tempting, common, and harmful. Yet, without a sound definition and set of criteria for mastery, it's unlikely that schools can move beyond such practices.

A Proposed Definition of Mastery
So, how might we better define mastery in education in a way that's helpful and that avoids the reductionism of earlier efforts? Kubina and Morrison (2000) propose fluency and frequency of correct performance as key components. Yet, although these criteria are useful, they, too, avoid the key question: fluency and frequency at what tasks? So I propose the following definition to advance the discussion:

> Mastery is effective transfer of learning in authentic and worthy performance. Students have mastered a subject when they are fluent, even creative, in using their knowledge, skills, and understanding in key performance challenges and contexts at the heart of that subject, as measured against valid and high standards.

Thus, effective transfer of learning, done with creativity, polish, and grace, is the essence of mastery. Mastery is not just technical knowledge. (Even in music, the term *virtuoso* is typically pejorative, implying mere speed with no soul.) You haven't mastered a subject if you only possess skills and facts in isolation and can only produce them on demand in response to prompts. Mastery must be tested using authentic tasks and scenarios at the heart of "doing" the subject. And instruction for mastery must be designed backward from these cornerstone tasks (Wiggins & McTighe, 2005).

The Common Core anchor standards in writing (National Governors Association Center for Best Practice & Council of Chief State School Officers, 2010) present good examples of such performance:

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

The anchor standards remind us not to fixate on the individual grade-level standards. Indeed, all coaches know that ability in skill exercises or drills does not necessarily yield masterful performance. Masterful performance

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means, as the three writing standards above suggest, that you can draw on a repertoire of skills and knowledge effectively, in context, with understanding of what you're doing and why. Mastery requires dealing effectively with varied and sometimes novel challenges of purpose, audience, and context.

An Example: The Mastery Master
This understanding of mastery was at the heart of the extraordinary record of John Wooden, the legendary University of California–Los Angeles (UCLA) basketball coach. As one of his former players, Sven Nater, recalls, in free-throw shooting (Nater & Gallimore, 2010).

Wooden described his overall method like this: "I tried to teach according to the whole–part method. I would show them the whole thing to begin with. Then I'm going to break

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Coach Wooden's goal was to teach the underlying concepts of offensive and defensive basketball, so that when opponents surprised us with new and different challenges we in turn surprised our coach and the other team with creative and effective solution methods. (Nater & Gallimore, 2010, p. 90)

Wooden's methods offer a beautiful example of backward design: shifting from a focus on practicing isolated skills to a focus on applying these skills with mastery in the game itself. Each year, Wooden would use the off season to take a close look at one of his team's weaknesses. One year he studied free-throw shooting. When he discovered that some successful coaches had made their free-throw shooting drills more like playing in an actual game, he changed his own team's practice sessions. Rather than shooting when completely rested and getting unlimited tries, players would scrimmage hard, do sprints, and then have only two shots within 30 seconds, just as they would in a game. The next year, UCLA led the league

it down into the parts and work on the individual parts and then eventually bring them together" (Nater & Gallimore, 2010, pp. 89–90). The constant process of bringing the parts back together in complex performance is what's routinely missing from many so-called mastery learning programs.

Question 2: How Good Is Good Enough?

Ensuring that students can perform authentic tasks is necessary for mastery, but not sufficient. We also need to ensure that we're assessing work on those tasks against valid, high standards. The Common Core anchor standards in writing state that a student must write analyses "clearly and accurately"—but just *how* clearly and accurately?

So that's our second key question: Given the tasks at the heart of mastery, how good is good enough? Even if we ask students to work with difficult texts and content, we might score the work too generously—setting the bar

low, to use a phrase borrowed from the high jump. Yes, they can jump quickly and fluently! But how high do they need to jump to be deemed masterful?

The recent hullabaloo over New York's cut scores (Sailer, 2013) illustrates how important and contentious this question is. To better align state tests with Common Core standards, the state asked more higher-order questions and made the cut scores for proficiency harder to attain. A score that used to be "good" was thus no longer "good." In other words, state policymakers raised the bar; they ratcheted up the official answer to the question, How good is good enough to indicate mastery?

I believe that such recalibration is needed. We have long known that state passing rates have often been way out of line with those of the National Assessment of Educational Progress (NAEP); the ACT; and international assessments. Hull (2008) found that on average, there was nearly a 40 percentage point difference between state and NAEP assessments of 4th graders' reading proficiency. And remediation rates in college average 40 percent of incoming students (Wiggins, 2010). As a result, it's hard to feel confident about local performance standards.

So this is hardly a new challenge or debate. Setting levels or cut scores has been a knotty technical and political problem since the advent of K–12 schooling. And that's true at least in part because we haven't reached agreement on how high the bar needs to be to establish mastery.

The Need to Face Local Grading Customs Squarely
Every teacher who grades students makes decisions about what level of performance is "good enough." Yet, in my work over decades, I have found

that most teachers merely come up with an algorithm for calculating grades rather than ensuring that their grades link to larger, defensible standards. The fact that such norm-referenced, individualistic grading is a time-honored education custom fails to justify it.
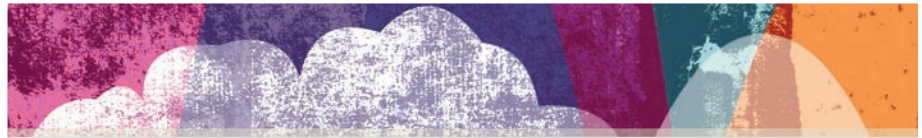
To see the harm of the current approach to grading, imagine a teacher who, like most teachers, gives *A*s or *B*s to her better students. But suppose that the school is one of the weakest schools regionally. She is thus giving grades determined by familiar local norms and low expectations, not measured against standards. Although the teacher is well intentioned, she is unwittingly setting up her students for heartbreak. They'll find out too late—through external tests and through their need to take remedial courses in college—that their performance is not good enough.

I'm not saying we should hold kids to absurdly high standards or give them only endless bad news. I am saying that we must provide valid feedback early and often. Knowing that you're a novice who's a long way from true mastery is not inherently debilitating. On the contrary, having a worthy, far-off goal and tracking your progress in closing the gap are key to mastery in all walks of life.

Ideally, then, students will know where they stand vis-à-vis wider-world standards long before they take any external test. In such a system, tests should simply confirm what the student and teacher already know—as now typically happens in sports and performance arts.

My Standard on Setting Standards
In a world of national standards, we must now face the issue that Bloom avoided. Regardless of what particular solution we come up with for linking

local grades to wider-world standards, this must be our motto: *No surprises; complete transparency as to where the student stands in terms of performance.*

We owe each student the facts as to where he or she fits in terms of wider-world standards. That's why arguably the most important and overlooked text in the Common Core English language arts standards is the appendix, where we find sample performance tasks and exemplars of student work.

Why did I include the phrase *in terms of performance*? Because far too many people in our field confuse content standards with performance standards. The standards question is not so much what to teach—the inputs—but rather what level of performance counts as mastery in local grading and scoring of student work—the outputs. In the workplace, when we say your work is not up to standard, we're referring to the quality of your product, not just whether you included the content. Similarly, in track and field we don't ask that you merely "cover" the high jump, and in French class we don't say you reached mastery just because you got decent grades on quizzes. We expect a performance output—a "good enough" jump

height or French conversation—that meets a defensible standard.

This is the crux of the matter: how to set school-level standards (and give grades, scores, or judgments in relation to them) in terms of valid external standards. If local tests are less rigorous than state and national tests, and if teachers' scoring and grading of student work reflect only local norms and not wider-world standards, then the school is *not* standards-based.

What, then, can local schools do as a practical solution to the challenge of determining mastery? I propose that rather than leaving this matter to local educators who simply use prior local assessments and results (as Bloom proposed and as currently happens), we let local educators make the call but ask them to devise a valid way of reporting out performance results against scoring standards that are either equal to or closely calibrated with the Common Core standards.

To avoid fruitless battles, students could continue to receive letter grades (which would provide a holistic look at how the student is doing as measured by teacher goals and expectations, more or less related to local norms). But at least twice a year, they should also receive a standards-based score, which would be derived from schoolwide assessments that reflect Common Core standards and which would incorporate tasks like those on the new Common Core–aligned assessments. Because the Common Core standards and their aligned assessments only address English language arts and math, teachers in other subjects could draw on released test items from high-performing states or countries (see "Websites for Sample Test Items Measuring Wider-World Mastery" on p. 15).

Effective transfer of learning, done with creativity and grace, **is** the essence of **mastery**.

Local Mastery of High Standards

A march through facts and subskills, dotted with numerous quizzes, is not a path to true mastery. Mastery is the effective and graceful transfer of learning to meet authentic performance challenges. The issue of getting students to mastery must be addressed locally by overhauling the quality of local grading and testing to calibrate them with wider-world standards. It is way past time that educators master the idea of genuine mastery. EL

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