Don't Play the Blame Game

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Over his career, Cary has directed more than 20 state and federal grant projects, including several that involved the development and testing of new curricula and methods of assessment.

In contrast with most standards documents that are created by university educators, scientists, and engineers, the writing team for the Next Generation Science Standards (NGSS Lead States, 2013a) consisted largely of current K–12 teachers. The purpose of including so many people who understood the constraints of today's science classrooms was to produce standards that teachers could manage to teach during a year of instruction and that students could succeed in learning. The result is a document that differs from prior standards in three important ways:

Limited Scope. Although the scope of knowledge and skills that students are expected to acquire is substantial, the amount that students are expected to learn is more limited than any previous standards documents. By limiting the list of what students are expected to know and be able to do at each level, teachers should be able to present science in greater depth than ever before.

Clarity. In prior years science standards typically began with a phrase such as, "Students will understand that…." Such statements can be interpreted in many different ways. As a result, even the most conscientious students may produce poor test scores if their teachers interpret the standards differently from the people who develop their state's test. In contrast, the NGSS provides clear and specific performance expectations that express not only what students should know, but also how they should be able to use that knowledge—so the same clear learning targets are available for curriculum, instruction, and assessment.

Coherence. The NGSS has identified just twelve core ideas that are essential for all students to learn and a K–12 learning progression for each core idea. According to the learning progressions, spelled out in Appendix E (NGSS Lead States, 2013b), later learning of essential core ideas at the high school level builds on prior learning at the middle school level, which in turn builds on more fundamental ideas and practices that students learned in elementary school.

By limiting the scope and providing clear and coherent learning targets, the NGSS has the potential to greatly strengthen science education. However, standards alone will not transform the system. The key to success lies in the understanding, commitment, and skill of our teachers.

Learning to implement the new standards will be a multi-dimensional process. In my view the most important dimension is for all science teachers—including elementary, middle, and high school teachers—to have a solid grasp of the entire learning trajectory of each core idea that they are responsible to teach. If a teacher is aware of what their students are expected to know and be able to do when they come into their classroom, and how this year's learning is supposed to prepare students for the next step in the learning progression, teachers can do a better job of ensuring that their students stay on course.

If it turns out that your students do not have the anticipated knowledge and skills—and here is where the title of this paper comes in—it is essential to refrain from playing "the blame game." To explain why, I'll end with a true story of a summer program for elementary teachers who wanted to improve their science teaching skills. One of the participants was a high school physics teacher who had a genuine interest in getting to know where his students were coming from, and in helping his elementary-level colleagues, whom he understood did not have the same strong science background that he did.

At first I was concerned that the high school teacher's deep knowledge of his subject would intimidate the elementary teachers, but in fact he was sensitive to that possibility and was very supportive. Things went along smoothly until one of the elementary teachers confided that the physics teacher let slip a comment to the effect that "if only middle school teachers had a better understanding of physics, then I could be much more effective." Of course the elementary teachers interpreted that to mean that they were being blamed for failing to prepare their students for middle school, so the middle school teachers would be able to prepare their students for high school.

To nip bad feelings in the bud, my co-teacher and I spent a little time the next day discussing with the whole group the findings from hundreds of research studies showing that delayed post-tests, conducted weeks or months after a unit, almost invariably resulted in lower scores. So by the time two or three years go by, and the students are due to study the same topic again, but at a deeper and more sophisticated level, they would not be able to exhibit the same knowledge and skills that they had when they completed the earlier unit.

To drive the lesson home, we ended with the following poem, which communicated the essential lesson, but kept the feeling in the room as light as possible.

The college professor said,
“Such rawness in a student is a shame.
Lack of preparation in the high school
Is to blame.”

Said the high school teacher,
“Good heavens, that boy’s a fool.
The fault, of course, is with
The grammar school.”

The grammar school teacher said,
“From such stupidity may I be spared;
They sent him up to me so unprepared.”

The primary teacher huffed,
“Kindergarten blockheads all—
They call that preparation?
Why it’s worse than none at all!”

The kindergarten teacher said,
“Such a lack of training never did I see,
What kind of woman
Must that mother be?”

The mother said, “poor helpless child.
“He’s not to blame.
His father’s people
Were all the same.”

Said the father,
At the end of the line,
“I doubt the rascal’s
Even mine.”

—Author Unknown

In conclusion, it is not uncommon for students who have developed substantial knowledge and skills in a subject to forget what they have learned by the time they are expected to study it again. Failure on the pre-test doesn’t mean that the prior teacher did a poor job or that your students are poor learners. It’s just the way people are. The learning process is not a continuous uphill march. Twists and turns, and even occasional dips are inevitable.

So if you find that your students do poorly on a diagnostic exercise at the beginning of a unit, recognize that it's your job to re-teach the earlier unit so that students who are struggling can catch up—all without boring students who are ready to move on! It's a challenging task for sure, but with knowledge of the overall learning trajectory, good formative assessments, and curriculum materials that have been tested with a wide range of students, it should be possible to help every one of your students succeed—provided you don't give in to the blame game.

References:

NGSS Lead States. (2013a). Next generation science standards: For states, by states, volume 1 the standards. Washington, DC: The National Academies Press.

NGSS Lead States. (2013b). Next generation science standards: For states, by states, volume II appendices. Washington, DC: The National Academies Press.