

What standardized tests should assess

By Marion Brady

If you fly, thank Myron Tribus for helping make your flight safer. He played a major role in the development of the equipment that keeps airliner wings free of ice.

Myron was a captain in the Army Air Force during World War II. Later, he was a gas turbine design engineer for General Electric, dean of Dartmouth College's Thayer School of Engineering, senior vice president for research & engineering for Xerox, an author of scientific papers and books, director of the Center for Advanced Engineering Study at the Massachusetts Institute of Technology, and co-founder of Exergy, Inc.

What brought Myron from California to my house in Florida for three days many years ago was our shared concern about what kids were and weren't being taught. We both believed that the [traditional curriculum](#) hadn't adapted to the 20th Century — much less the 21st — and that the reforms being promoted by business interests and politicians weren't just making the situation worse but blocking real reform.

Myron agreed with me that [deciding what knowledge is most important](#), and using systems theory to simplify the organization of that knowledge, were logical first steps in real education reform, and that's what we talked about.

I've stopped thinking I'll live to see those ideas being taken seriously. Today's reformers take it for granted that what was taught in the past is fine for the future, and their ideas about the organization of knowledge begin and end with the simplistic, knowledge-fragmenting ["Common Core State Standards."](#) The latest evidence is the just-released report from a committee chaired by Condoleezza Rice and Joel Klein titled, "U.S. Education Reform and National Security."

That said, I can't bring myself to simply walk away from the educational catastrophe that's been unfolding since the U.S. Chamber of Commerce, the Business Roundtable, the American Legislative Exchange Council, and other rightwing groups took control of education policy in the 1980s and pulled the rest of the political spectrum with them. Concern for the educations of my nine great-grandchildren, for their children, and for their children's children, won't let me desert the field.

I've got a modest proposal. No Child Left Behind, and now Race to the Top, have made [standardized tests](#) the sole measure of educational quality. What makes those kinds of tests acceptable is the ridiculous notion that machines can measure brains, but the campaign to discredit teacher judgment of student performance has been so successful there's no going back. Standardized tests are here to stay. Attacks on them are dismissed as lame efforts by teachers to avoid being held accountable.

Manufactured tests, then, must be accepted, but must be made to do good rather than harm. The practice of testing what's taught is out the window. Now, what gets tested is what gets taught, so the simplest, most direct way to improve what's taught is to improve the tests.

Arne Duncan, U.S. secretary of education, says kids need to be taught "higher order" thinking skills. If teachers teach to tests, and standardized test items require the use of higher order thinking skills, those skills will be taught.

I propose that all standardized tests test higher order thinking skills.

What, exactly, are "thinking skills?" Asked, most professional educators will make lists something like the one below. They'll also generally agree that every skill on the list except the first one—*recalling*—is a higher order thought process.

Recalling
Classifying
Applying
Inferring
Hypothesizing
Generalizing
Relating
Synthesizing
Valuing

Science test question: *"You've studied some of the ways that plants and animals have evolved to protect themselves from harm. Which of the following five ways is NOT a self-protection strategy?"*

To answer, the test taker just has to remember something read or heard. That's *recalling*, and it's not a higher order thinking skill.

Science test question: *"You've studied some of the ways that plants and animals have evolved to protect themselves from harm. Choose one of those self-protection strategies and explain how it could be adapted to protect convenience store clerks from harm."*

To answer, the test taker has to put an idea that's been learned to practical use. That's *applying*, and it's a higher order thinking skill.

History test question: *We've been studying big ideas called 'shared assumptions' that help hold human societies together. In the spaces provided, list four of those assumptions."*

To answer, the test taker just has to remember something read or heard. That's *recalling*, and it's not a higher order thinking skill.

History test question: *"We've been studying big ideas called 'shared assumptions' that help hold human societies together. Below is a copy of a page from the 1777 New England Primer that*

uses two-line verses based on the Bible to teach the letters of the alphabet. Based on the verses, what assumption about basic human nature seems to have been shared by 18th Century Puritans?"

To answer, the test taker has to draw inferences from the verses. *Inferring* is a higher order thinking skill.

If higher order thinking skills are tested, teachers will teach them. Those who don't know how will quickly learn.

Of course, Pearson, McGraw-Hill, Educational Testing Service, and other test manufacturers aren't going to volunteer to test student-initiated higher order thinking skills. Neither are the politicians they help elect and re-elect going to make them even try to do so unless they think voters give them no alternative.

So voters should give them no alternative. Unless politicians and test manufacturers can make a convincing case for not teaching the young to think, they should be told what they've been telling teachers who say standardized tests are a waste of time and money: "No excuses!"

It's likely that nothing short of binding agreements between states and test manufacturers will yield the new tests. To that end, in appropriate legal language, contracts should make clear that (a) every test question in every subject will evaluate a particular, named thinking skill, (b) every test will evaluate a balanced mix of all known thinking skills, and (c) a panel of experts not connected to test manufacturers or politicians will preview all test items to assure contract compliance. No excuses.

Fairtest, Parents Across America, United Opt Out National, and other state and local organizations have strategies in place to try to persuade. Petitions and [referendums](#) invite signers. Parents, grandparents — indeed, all who care about kids and country — should get on board.

No more multimillion dollar checks for tests that no one but manufacturers are allowed to see. No more tests the pass-fail cut scores of which can be raised and lowered to make political points. No more kids labeled and discarded, every one with a brain wired to do all sorts of amazing things. If storing trivia in short-term memory doesn't happen to be one of those things, that shouldn't put them out of school and on the street.

Postscript: Myron hasn't been well for a long time, so we haven't talked in years. I last saw him at his 80th birthday party. A documentary film crew from Russia was there. When I asked why, they said that in Russian scientific circles, Myron was a hero.

He's also one of my heroes—a genuine genius who understood the absolutely critical role that school curricula play in promoting and maintaining societal well-being, and dedicated his pre-illness retirement years to trying to improve it.