

JOHN BAER

11. CREATIVITY AND THE COMMON CORE NEED EACH OTHER

OVERVIEW OF THE CHAPTER

Many fear that rigorous content standards will impede efforts of those who want to nurture creativity in students, but the Common Core and creativity offer each other far more potential synergies than obstacles. Creativity requires content skills and knowledge—very substantial degrees of skill and knowledge in some domains, with the degree of expertise needed generally increasing for higher levels of creative performance—so the development of such content knowledge and skills promotes the development of creativity by providing many of the tools needed for creative thinking. Conversely, the best way to acquire skills and knowledge is to use that knowledge and those skills in thoughtful, constructive, and creative ways, making creative thinking an excellent way to help students acquire content knowledge. Learning content shouldn't be thought of as the "rote learning of easily measured knowledge and skills," as Ambrose (chapter 2, this volume) reminds us. "Broad and deep proficiency in the subject areas" can only be achieved by thoughtful, constructive, and often very creative thinking about the content of each subject area.

There are areas of possible contention, of course (e.g., extrinsic constraints often support skill acquisition but may in some cases hinder creative thinking), but many of the alleged content knowledge-creativity conflicts are merely the result of misguided notions, such as the idea that learning content means nothing more than parroting back what Ambrose calls "superficial facts" instead of "grappling with interesting problems in the subjects and mastering key concepts." "[G]rappling with interesting problems in the subjects and mastering key concepts" is what the acquisition of content knowledge is really about—"deep-level cognitive and affective immersion in a variety of subject areas including literacy, the arts, mathematics, the sciences, world languages, history and governance" (Ambrose, chapter 2, this volume).

Another unfortunate misconception is the belief that we must be able to *measure* every outcome that we care about. Valid and meaningful assessment is hard, especially if we want to assess complex kinds of thinking, but the fact that we may not be able to test, in a standardized format, some of the things that we want to teach should not prevent us from teaching or valuing those things. For this reason, Common Core *testing* may be a genuine roadblock and the use of such tests for any high-stakes decisions (e.g., who gets a diploma, or who gets—or gets to keep—a teaching job) should be reconsidered, but that is no reason to avoid using the Common Core (or

another set of rigorous content-based standards) as guides in education. We can (and should) teach things that matter whether or not we can test them adequately.

Promoting content knowledge and skill acquisition in many domains (as outlined in the Common Core) *and* the nurturing of creativity should be part of 21st-century schools. Schools that want to prepare students to meet 21st-century challenges should be thinking more about how they can work toward these two seemingly different goals simultaneously and synergistically, not about creating false conflicts and contradictions that set them at odds with each other.

THE COMMON CORE AND ITS CRITICS

The Common Core outlines a shared roadmap of the concepts, skills, and knowledge students need to learn, regardless of where they live. It was spearheaded by the National Governors Association Center for Best Practices and the Council of Chief State School Officers, but it has more recently become a political hot-button issue.

It is not my intention to defend the Common Core. I happen to think it's a fairly good compromise framework—some would fault it for not being specific enough about content, just as others might argue that it is too specific—but like it or not, it's the framework that most states will be using. Having a state-imposed set of standards isn't something new—states have always had these, some possibly better, most surely worse, than the Common Core. The big difference is that this one is an almost national set of standards, which means that students moving from one school district to another—something poor kids do more often than rich kids (Heinlein & Shinn, 2000; United States General Accounting Office, 1994)—will find their educational programs somewhat less disrupted than in the past.

The Common Core isn't perfect, and when I titled this chapter *Creativity and the Common Core Need Each Other* it was not because of a deep affection for this particular set of standards. What creativity needs is a good set—let's not wait for a perfect set—of standards outlining important skills and content knowledge that students need to acquire. I think the Common Core, albeit imperfect, provides such a set of objectives.

The Common Core's most serious problems—and the loudest criticisms—have to do with assessment, which should not be surprising. I worked at the Educational Testing Service (ETS) many years ago developing alternatives to multiple-choice testing. I know how hard that is, and I'm not surprised that assessment has become a problem for the Common Core. Everyone complains about the current crop of assessment devices, but many then blithely assume that the next time we'll get it right, as if the people who did all previous educational assessments were either stupid or mean-spirited (or perhaps both). But assessment—rigorous, meaningful, valid assessment—is simply hard. Very hard.

The difficulty of valid assessment of complex learning is not a problem that I can fix. It's also not a problem that only came to light with the Common Core. And it's not a problem that critics of the Common Core can fix either, nor is it a problem

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that will go away if the Common Core is repealed or gutted. We can assess simple things rather easily and quite validly, but assessing complex things like thinking and deep understanding, like creating and analyzing and applying ideas in new and unexpected ways—that's hard. Not impossible, but hard, *very* hard. It's especially hard if we want to do it with a test that can be nationally standardized, and even harder if we want individual test results that can be used for high-stakes decisions, like who gets a diploma or who gets (or gets to keep) a job. If all we want is a snapshot of how different groups of students are doing, tests don't need to be as good because many of the unreliability problems tend to disappear when averaged over a large number of test takers. But getting reliable and valid *individual* scores? That's asking a lot, probably far too much, of a 2- or 3- or 5-hour activity. I don't think anyone wants students to need to spend 40 or more hours taking tests every year, which might be needed to get enough data to make valid individual assessments of higher-level skills in diverse domains (nor does anyone want to pay teams of experts to read and grade those test papers). We need to scale back what we think tests can reasonably tell us.

Our expectations of tests may be way too high, but that doesn't mean we can't have high expectations of students. We may not be able to assess how well each student is meeting those expectations in a nationally standardizable way, and we may not be able to fairly compare teacher competence in helping students meet those high expectations with a single test. But I don't think we want to give up on having kids think deeply and understand ideas deeply, on having them create and analyze and apply ideas in new and unexpected ways, even if we can't assess those abilities as well as we'd like. Whether it's the Common Core or the next set of curricular standards, assessment will be hard, but that shouldn't stop us from teaching and promoting complex thinking or expecting students to do complex thinking. Right now the standards most widely in use are the Common Core State Standards, so those are the ones we need to address, but pretty much everything I'm going to say about the Common Core and creativity would also be true with any rigorous set of curricular standards or guides (something I've been researching and writing about for a long time, long before there was a Common Core; see, e.g., Baer, 1999, 2002, 2003; Beghetto, Kaufman, & Baer, 2015).

HOW DO CREATIVITY AND THE COMMON CORE NEED EACH OTHER?

We're going to have curricular requirements, whether those are based on the Common Core or some other set of standards. But having rigorous standards that expect students to acquire a great deal of content knowledge and a wide range of skills need not push creativity out of our classrooms. In fact there are real synergies between teaching the Common Core and nurturing creativity.

But first, an acknowledgement: Creativity has a dark side (Cromptley, Cromptley, Kaufman, & Runco, 2010); some terrorist groups have been remarkably creative in very malevolent ways—and even in our classrooms there are some kinds of creativity

we want to promote and others, like creative classroom disruptions, we might wish to minimize. I will nonetheless take it as a given that we want to promote students' creative-thinking skills in many areas, just as I am taking for granted the existence of the Common Core or some other rigorous set of standards that might one day supersede the Common Core. The question is, can creativity and the Common Core get along? Can they play nicely, or must they be at war with one another?

Many teachers seem to think that they must choose between nurturing student creativity and conforming to the Common Core standards. How can creativity, which requires producing things that are unusual and original—and therefore decidedly *uncommon*—be combined with the Common Core, which even its name declares is common and which would therefore seem to be the exact opposite of creative? With the Common Core claiming so much of teachers' time and attention, creativity—which invites uncommon, original, and boundary-breaking thinking—seems a prime target for being crowded out of an already over-stuffed curriculum.

The Common Core Needs Creativity

There are many parts to the Common Core, and some standards look like the kinds of things that might in fact require fairly rote practice to learn. For example, in the Common Core (<http://www.corestandards.org/>) students need to do these things in kindergarten:

- CCSS.Math.Content.K.CC.A.1. Count to 100 by ones and by tens.
- CCSS.Math.Content.K.CC.A.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
- CCSS.Math.Content.K.CC.A.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

Drills and rote memorization are likely to be involved in learning the first two of these, and to lesser degree the third as well, but even learning this very basic math content will require what Beghetto and Kaufman (2007; Kaufman & Beghetto, 2009) have termed “mini-c” creativity—the creativity that happens in the learning process—which recognizes that every understanding must in some way be constructed in the learner's mind. Students' minds are not empty vessels into which we can simply pour content, even very basic content; each learner's mind must undergo some change to accommodate what is being learned, and those accommodations, those (however slight) changes in one's understanding, require some, very modest, degrees of creativity. There is also a rote component to acquiring these skills, however, and it's important to acknowledge that some rote memorization will play a role in this (and any) curricular scheme. Like simple math facts, these are things that students need to understand, but also to automatize. The goal of such automatization is to be able to do them without thinking so that other, more interesting kinds of thinking can occur. It's hard to think of a set of curricular standards that would not

include the three listed above in some form, and in whatever form they appear, some rote memorization will be part—but only a part—of acquiring these skills.

Rote memorization will play a role in teaching to any curricular standards, but most of the things one finds in the Common Core are *not* things one could successfully learn via drills, rote memorization, or simple repetition. Drills and repetition are simply not the most effective ways to learn most skills and content, which are more readily, more flexibly, and more usefully learned by using and applying them in a different contexts; by connecting them to what one already knows; and by analyzing them to gain a deeper understanding (Woolfolk, 2012). Put another way, most skills and knowledge are best acquired by thinking, not by rote memorization. The Common Core State Standards are for the most part (and with limited exceptions like those described above) not things one could learn through rote memorization. The Standards require students to be able to *do* things with the skills and content knowledge they are acquiring and to produce original, constructive, and meaningful ideas (which is another way of saying they will need to think creatively).

Here are three skills (the first three) in the grade 3 English Language Arts standards for reading literature:

- CCSS.ELA-Literacy.RL.3.1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- CCSS.ELA-Literacy.RL.3.2. Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.
- CCSS.ELA-Literacy.RL.3.3. Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.

Memorization won't work here. One must produce ideas, not from a void, but based on the content with which one is engaged. To do this one first needs to understand what one has read, but then one must go beyond this and come up with answers that have not been provided, answers that are new and original (at least new and original to the student). There is no regurgitation, no drill-and-kill called for. What is called for is thinking, including a great deal of creative thinking.

And this isn't just in the English Language Arts Standards. Here's one from the Grade 8 Math Standards:

- CCSS.Math.Content.8.F.B.4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Constructing a function to model a linear relationship between two quantities isn't about rote memorization, and it's not something one can do without both

understanding something about functions and figuring out how to apply that understanding to new situations. It requires understanding a number of things, figuring out how to use those things, and coming up with answers students have not been given, answers that fit the specific situation described in the problem. Doesn't "coming up with answers students have not been given, answers that fit the specific situation described in the problem" sound a lot like creativity? A teacher who tried to teach to this standard by rote and without encouraging creative thinking would be handicapping her students.

So the Common Core has only a little to do with rote memorization or content regurgitation. It's much more about using facts and using skills to make sense of things; it's about constructing new knowledge and new ways to understanding things. It requires creative thinking. So teaching the Common Core should not lead to lots of mindless drill and repetition. There will be some—as there has always been, such as in learning things like multiplication facts and spelling. But learning the skills of the Common Core will mostly require *thinking*—thinking hard and deeply, and sometimes very imaginatively—about content in many different domains so that one can understand and *use* those skills and that content knowledge, not so that one can parrot something back. Drill-and-kill should play a very limited role in Common Core classrooms, and if teachers rely heavily on rote recitation they won't be very successful in teaching the Common Core. And if the test designers who create the tests for the Common Core devise things that reward parrot-like responses, they will have failed utterly in their assignment. That is not what the Common Core, or any good set of curricular standards, calls for.

Creativity Requires Content Knowledge

One may need sometimes to think outside the box, as the cliché goes, but one also needs to understand what is actually *in* the box, as well as what the box itself is made of. As Ambrose has pointed out in his focus chapter, we are facing some very big problems, problems that will require a great deal of creativity to solve. But facing these challenges will also require a great deal of content knowledge and a great deal of domain-based skill. To pick an especially troubling example, I don't know how the climate-change crisis will be solved (or if it will be solved), but I am confident that dealing with it will require such things as a knowledge of chemistry and a rather full calculus skillset—knowledge and skills that are very much *inside* the box. Outside-the-box thinking may also be needed—we will need certainly responses that go beyond current knowledge and ideas—but the fact that original, creative thinking must be involved in no way negates the importance of more routine (common) skills and knowledge.

So acquiring content knowledge isn't inimical to creative thinking or teaching for creativity; in fact, it's *necessary* for creativity. And some of the best ways to acquire content knowledge is to *think about it* in interesting, creative ways, as discussed in the previous section. The two can go hand-in-hand in many instances, but they may

sometimes seem at odds because of one troubling misconception about creativity that I hear far too often: *Creativity means everything goes and that there are no wrong answers.*

It has been argued that divergent thinking is an important component in creativity, and brainstorming is one widely used technique to promote divergent thinking (Baer & Kaufman, 2013; Woolfolk, 2012). There is evidence that brainstorming, especially when conducted in groups, may not be as productive as once thought, and one might even question how important divergent thinking is, but for the sake of argument let's assume both divergent thinking and brainstorming are valid and valuable contributors to creative thinking.¹ The important point in regard to the anything-goes misconception about the nature of creativity is that brainstorming is often viewed as a prime tool for generating creative ideas and that its first commandment is *Thou Shalt Not Judge.*

Does *Thou Shalt Not Judge* when brainstorming mean there are no wrong answers in creativity? Not at all! It means that *in one stage* of a creative process it may be useful to *defer* judgment, and during that time there are, indeed, no “wrong” answers. But that's just temporary—defer means put off until later, not abandon forever. It's rather like the use of invented spelling with new (kindergarten and first-grade) writers, who may be told to spell words initially any way that makes sense to them (Clarke, 1988). In invented spelling, no one is saying spelling doesn't matter, only that it doesn't matter right now. Ditto for deferring judgment when brainstorming. Defer means defer. Judgment matters, but it will come later.

Some creativity-training programs have indeed stressed divergent thinking and de-emphasized convergent and evaluative thinking. But an over-emphasis on divergent thinking to the exclusion of everything else is simply a problem with having a very limited understanding of the creative process. Successful creativity involves multiple iterations of divergent thinking combined with a great deal of convergent and evaluative thinking. For example, students may first engage in divergent thinking when confronting a new problem, doing such things as brainstorming many possible ideas about just what is the problem that needs to be solved (“In what ways might we...?”). But they will then need convergent and evaluative thinking to help choose the best problem to tackle or the best way to understand the problem. Divergent thinking may then be used again to produce a variety of possible ways that the problem might be solved, but convergent and evaluative thinking will once again be crucial when it comes to selecting the best way to proceed. There may be multiple iterations of divergent thinking, each followed by evaluative and/or convergent thinking. These stages will not generally have neat demarcations between them. Only in the most formal problem solving practice is the distinction among divergent, convergent, and evaluative thinking crystal clear, but all are generally needed to find the best possible and most creative solutions (Baer & Kaufman, 2013). As Persaud (2007) wrote:

Creativity is usually defined in terms of the production end of ideas or products, yet a neglected aspect of creativity, though no less vital, is the process by

which creative products are critically evaluated, selected, altered or dismissed by the creator. Any attempt to promote creative thinking skills in schools needs to also address this aspect of critical thinking in creativity—failure to do so results not in usefully creative children, but merely indulgent ones. (p. 68)

Consider this Common Core standard, one we looked at briefly in the previous section:

- CCSS.ELA-Literacy.RL.3.3. Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events

To help students do this, teachers might encourage them to list every possible way they might describe the character (divergent thinking), then go through that list to pick out the descriptors that seemed to best fit the character (evaluative thinking). Then for each of those traits, motivations, or feelings, students might be asked to list ways those characteristics could have influenced the plot or outcome of the story (divergent thinking). Choosing among the list of traits, motivations, or feelings the ones that seemed to have the biggest impact on the events of the story (evaluative thinking) would put the student in a good position to begin her essay.

Skills and content knowledge are important in evaluative thinking—judging ideas—and in convergent thinking—finding the right answer. And skills and content knowledge are also important contributors to divergent thinking, because the more one knows about a domain, the larger the problem space (the bigger the “box”) within which one can work (and the greater the range of possible solutions one can imagine). One needs content knowledge to think well and creatively, and generally speaking, the more content knowledge the better (Reilly, 2008; Weisberg, 2006). It may be true that at the extremes, too much content knowledge can sometimes hinder creative thinking—this is the functional fixedness problem (e.g., not recognizing that a hammer can be used for more things than driving nails)—but that’s really a problem of how one *uses* knowledge, not of having it. (Most skilled carpenters readily use hammers in other ways than driving nails, such as propping something open, extending their reach to push something, or holding something down. Their content knowledge need not be a barrier to their creative thinking.)

Creativity researchers are nearly unanimous in arguing that creativity involves coming up with new ideas that *work*; as Mumford put it, “we seem to have reached a general agreement that creativity involves the production of novel, useful products” (2003, p. 110). Creativity isn’t usually about finding the one right answer to a problem that has one, and only one, right answer, although that is sometimes the case. Creativity is more often about messy problems, ones that offer no single right answer. Creativity requires imagining ideas that work, that get the job done, that fit the constraints of the situation, that solve the problem in a way that is deemed effective. Divergent thinking and the production of wild ideas may,

or may not, be part of that process. No one would argue that divergent thinking and wild ideas never lead to creativity, and no one would dismiss creative ideas simply because they were not sufficiently wild or the result of brainstorming or some other divergent-thinking technique. But everyone agrees that being creative means coming up with ideas that are useful, ideas that are interesting *and* in some manner workable.

Finding ideas that work, ideas that are interesting and useful, typically requires some amount—often a very large amount—of knowledge and skill. That is to say, it requires exactly the kinds of things the Common Core says students need to learn. Creativity doesn't work in a vacuum. Creativity needs the skills and content knowledge of the Common Core.

Conversely, divergent thinking, a theorized component of creativity, can also be helpful in acquiring factual knowledge. For example, if a teacher is starting a unit on Abraham Lincoln, the teacher might have students brainstorm what they already know about Lincoln, listing all the class's ideas on the board. This serves the important function of activating prior knowledge, so the new things learned will become connected to what students already know. It also gives the teacher a sense of what her students do already know and what misconceptions they may have. All this because of a brief brainstorming session—an activity generally associated with teaching creative thinking.

Are creativity and the Common Core natural or inevitable partners? Perhaps that would be going too far, because there are times when they do seem to conflict, and teachers need to recognize those rare but nonetheless troubling conflicts. One of the most common conflicts of this type has to do with motivation. Intrinsic motivation tends to promote creativity in many situations, whereas extrinsic constraints (like rewards and evaluation) tend to depress it.² With skill development extrinsic constraints work differently: rewards and evaluations are often very helpful in promoting the development of skills, and in many cases (such as providing feedback on students' work, which is a form of evaluation) they may be essential. But this is not a huge obstacle: teachers can and should promote intrinsic motivation when possible and employ extrinsic constraints when necessary, and finding this balance need not sacrifice either creativity or skill development greatly. It's important to understand that, for the most part, creativity and the Common Core *can and should be* allies, as shown above, whether such an alliance is viewed as natural and inevitable or one that needs to be sought out and strategically nurtured. We need to recognize that creativity and rigorous content standards are not natural enemies and look for all the synergies we can find. Fortunately there are far more ways in which creativity and the goals of the Common Core can work together than there are ways in which they are in conflict. In most respects, teaching for creativity and teaching the Common Core should promote one other. Neither the goal of creativity enhancement nor the goal of skill and content knowledge acquisition will be very successful if its counterpart is ignored.

J. BAER

The Need for Domain-Based Content Skills and Knowledge Is in Accord with an Interdisciplinary Approach to Problem Solving

In his focus chapter and elsewhere, Ambrose (2012 and chapter 2, this volume) has emphasized the value of interdisciplinary thinking and problem solving. I really like that word, “interdisciplinary.” It doesn’t suggest that disciplines or domains don’t matter—in fact, it suggests just the opposite, because without disciplines, there can be no interdisciplinary anything. Just as creativity requires the kinds of skills and content knowledge that the Common Core is designed to promote, interdisciplinary thinking requires the kinds of expertise that disciplines develop.

Interdisciplinary thinking and problem solving can sometimes run off the rails, as I have argued elsewhere (Baer, 2012), but when that happens the most likely culprit is lack of disciplinary knowledge. It can sometimes be extremely helpful to bring perspectives from different disciplines to bear on a problem, and at times an idea or metaphor from a distant discipline can be exported productively into a seemingly unrelated discipline. But it is far too easy (and I fear much more common) for those lacking the relevant expertise to misunderstand the issues or constraints that someone with expertise in the relevant domain(s) might have. Good interdisciplinary thinking and problem solving require strong disciplinary skills and knowledge (the kinds of things the Common Core was designed to promote).

THE PROBLEM OF TESTING

It is understandable that people want schools to be accountable for their results. Students should be learning, and they should probably be learning a lot more than most students are in fact learning. That was part of the motivation for the creation of the Common Core State Standards.

Accountability has a counting problem, however. It cannot account for things it cannot count, and the things that can be measured well by the kinds of tests currently available (and likely to be available any time soon) do not include many of the outcomes that we most care about, such as creative, higher-order thinking in diverse domains. Assuming that the answer to this counting problem is simply getting better tests ignores the fact that “better tests” has long been seen as the answer. Unfortunately, it is an answer that has not been rewarded by the production of tests that actually measure important things like creativity in a fair and valid way, at least not with the kind of precision and standardization that any high-stakes decision requires.

We need to acknowledge that there are things we can’t measure well (at least not in a standardized format) but that nonetheless matter to us a great deal.³ In addition, we need to recognize that if we do have high-stakes tests in some areas and no tests in other areas, the areas tested will get all the attention. An economist who specializes in value-added modeling made both these points in arguing that “Decisions about standardized testing should be driven by the testability of particular subjects and

with an eye toward ensuring that they don't distort teaching in unproductive ways" (Harris, 2011, p. 181). By (a) focusing our attention only on the things we can test and (b) pretending that we can reduce interesting, heuristic, productive, and creative thinking in ways that make them testable (but rendering them uninteresting, algorithmic, nonproductive, and formulaic in the process) we subvert both the goals of nurturing the most important skills embodied in Common Core and of cultivating creative thinking in our students.

There is an odd incongruence in the thinking of those who believe that high-stakes testing will motivate teachers to teach better but that the same teacher-motivating tests will not encourage teachers either to cheat or to distort their teaching practice. Arne Duncan, for example, argued that "The existence of cheating says nothing about the merits of testing" (*Washington Post*, July 11, 2011), and President Bush asserted without qualification that "We're teaching a child to read so he or she can pass the test" (in a speech, "Remarks on the No Child Left Behind Act," January 8, 2009).

It's hard to understand how the rather widespread reports of cheating on tests, the scores of which will be used to determine teachers' and administrators' futures and which were put into place with the express goal of changing the behavior of those teachers and administrators, can fail to be seen as one effect of those tests (Goldstein, 2014). Why would the teachers and administrators cheat if the outcome did not affect them in a significant way? That was the point of the assessments.

A behavioral economist contributor in the same *Washington Post* "leadership roundtable" in which Education Secretary Duncan suggested that cheating was not the fault of testing made a very different argument, using this story from a CEO he respected highly who confessed that he had over-incentivized his employees: The CEO "had tried to create a specific performance evaluation matrix for each of his top employees, and he asked them to focus on optimizing that particular measure; for some it was selection of algorithms, for others it was return on investment for advertising, and so on. He also changed their compensation structure so that 10 percent of their bonus depended on their performance relative to that measure. What he quickly found was that his top employees did not focus 10 percent of their time and efforts on maximizing that measure, they gave almost *all* of their attention to it" (Ariely, *Washington Post*, July 18, 2011).

Teaching to the test is a more complex phenomenon than cheating, one that (unlike cheating) is not necessarily a bad thing if the test in question can be shown to be an excellent measure of whatever it is one wants students to learn. Unfortunately, tests of higher-order thinking (including creative thinking) tend not to be very good, especially if those tests need to be standardized in a way that makes them comparable across students, schools, and states. To the extent that such a test is *not* an excellent measure of the kinds of thinking one wishes to promote, it means that teachers are teaching to something other than their stated objective. In such a case, teaching to the test changes the goal from promoting thinking to passing the test, which (to the extent that the test measures something different, or less than, the original goal)

means that testing has significantly changed the goals of the teacher. If the test not only fails the “excellence” standard but is in fact a very poor measure, the warping of instruction by teaching “so that he or she can pass the test” will be extreme.⁴

High-stakes testing has not improved the quality of education in this country, and it is unlikely that it is going to. In a survey article for *Educational Leadership*, Amrein and Berliner (2003) reviewed research in 18 states that required students to pass state examinations to graduate from high school, evaluating whether student achievement—as measured by the SAT, ACT, Advanced Placement tests, and the National Assessment of Educational Progress—was connected to the implementation of that state’s graduation exams. They found no evidence of an increase in student achievement. That was last decade’s attempt at implementing high-stakes testing, of course, but there is no reason to believe that the next round of testing will produce different results. There has been no revolution in testing, no new approach that completely overturns all that has come before. As noted above, testing is hard, and the more interesting and complex the thinking one wishes to assess, the harder testing becomes.⁵

Low-stakes testing programs that (a) look only for mean scores of large groups of students and (b) are not used for any high-stakes decisions (e.g., teacher promotion or retention, student admission to colleges or special programs) can give us some information about how students are doing while avoiding some of the harm that seems to be caused by high-stakes testing (Ravitch, 2011). But we need to remember that what is important are the skills and knowledge that students acquire, not our measures of those things. High-stakes tests are getting in the way of achieving the results we all want. The answer is not more testing, but less high-stakes testing.

Creativity and the Common Core should be allies—for the most part they are on the same team—but there are some areas in which creativity and the Common Core have genuine conflicts. The biggest such conflict is not really between creativity and the Common Core, however; it is between the acquisition of complex skills, like creativity, that matter to us, and our desire to test and measure everything that matters.

CONCLUSION

Creativity matters. It matters because the world—all the world, not just select parts of it—will need all the creative thinking we can muster to solve the many gigantic global problems we are now confronting (not to mention the ones that we haven’t recognized yet and the ones that have not yet come into being). In his focus chapter Don Ambrose has aptly described many such challenges.

Creativity also matters because even on smaller scales it helps us make the world a better place. Creativity in the arts, in teaching, in science, in engineering, in history, in philosophy, in personal and interpersonal problem solving, in spiritual quests: in all these and many other areas creativity has the potential to make life better, richer, more meaningful, and more interesting.

Finally, creativity also matters—perhaps most of all—because, apart from the need for creativity to help us survive the problems of the present and the future and make our world an ever-better place for human and other forms of life, life is also better on an individual level when we have the skills, the knowledge, the dispositions, and the freedom to think and act and live creatively, for the very simple reason that thinking creatively and doing things creatively are themselves important parts of what makes life so wonderful. Creativity matters because the experience of creating and of thinking creatively are good things, even when they don't change the world in noticeable ways. Creative play by children, creative writing, creative cooking, creative woodworking, and creativity in all the things we do—even creative daydreaming—makes doing those things more exciting, more joyful, and more worthwhile, even when those activities make no imprint on the world at all. Creativity is something we should all want to nurture because it has the potential to make the world a better place, but also because it is a good unto itself.

There are many things teachers can do to teach creativity in a Common Core classroom. It is beyond the scope of this chapter to describe in more than a rudimentary way how to do this (but please see the book in which some colleagues and I have done just that; Beghetto, Kaufman, & Baer, 2015). Teachers will need support in pursuing the twin goals of nurturing creativity and teaching content knowledge.⁶ The danger is that they might falsely assume that these two goals—meeting requirements of a Core-based curriculum and nurturing students' creativity—are essentially at odds. They are not, and these two complementary goals will both be better achieved if thought of as partners rather than as adversaries. We need also to recognize, however, that extensive high-stakes testing is hurting, not helping, our efforts to improve schools. We therefore need to de-emphasize high-stakes testing to improve education. Unimpeded by ill-conceived high-stakes tests, the Common Core and creativity can achieve the kinds of synergies that, by their natures, should make them mutually supporting allies.

NOTES

- ¹ Brainstorming might work well in some domains and situations and not others (Baer, in press). The erratic results of studies of group brainstorming—sometimes it produces creative ideas, but sometimes it appears to hinder creativity—suggests this might in fact be the case (Diehl & Stroebe, 1991; Mullen, Johnson, & Salas, 1991; Nijstad, Stroebe, & Lodewijckx, 2003; Rickards, 1999). Resolving those conflicting results is beyond the scope of this chapter, but whether or not it reliably produces creative thinking, brainstorming can be a useful teaching tool, as discussed below. It has unfortunately contributed to the misconception that creativity means there are no wrong answers, however.
- ² There is some dispute about whether or not extrinsic constraints consistently depress creativity, and in fact in some studies the impact has been just the opposite. It may be that in different domains or situations the impact is different (Baer, in press), which would account for the many contradictory studies in this area, some showing a pronounced negative impact of extrinsic motivation, others showing a positive impact or no impact (see, e.g., Amabile, 1996; Baer, 1997, 1998; Conti, Collins, & Picariello, 2001; Eisenberger & Cameron, 1996; Eisenberger & Shanock, 2003; and Eisenberger & Rhoades, 2001). Like the question of the impact of brainstorming on creativity, this is a controversy larger than the scope of this chapter.

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- ³ This is not to suggest that creativity can't be measured, merely that it cannot be measured in the ways that those calling for accountability in schools seem to require. Just as Nobel Prize committees in particular fields can successfully judge (albeit imperfectly) creativity at the highest levels in their respective fields, experts in a domain can judge the creativity of more garden-variety creativity in that domain (e.g., poets can reliably and validly assess which of a group of poems are the most and least creative, and artists can reliably and validly judge which of a group of collages are the most and least creative). But such consensual assessments (Amabile, 1982, 1983, 1996) cannot be scaled up to provide nationally standardized creativity scores, even on a domain-by-domain basis.
- ⁴ In the same *Washington Post* article cited above, Dan Ariely (2011) concluded that the warping of instruction is a much greater problem than the more publicized cheating scandals, writing:
- The notion that we take something as broad as education and reduce it to a simple measurement, and then base teacher pay primarily on it, has a lot of negative consequences. And, sadly, I suspect that fudging test scores is relatively minor compared with the damage that this emphasis on tests scores has on the educational system as a whole.
- Interestingly, the outrage over teachers cheating seems to be much greater than the outrage over the damage of mis-measurement in the educational system and over the No Child Left Behind program more generally. So maybe there is some good news in all of this: Perhaps we now have a reason to rethink our reliance on these inaccurate and distracting measurements, and stop paying teachers for their students' performance. Maybe it's time to think more carefully about how we want to educate in the first place, and stop worrying so much about tests.
- ⁵ There have been conflicting views about the impact of high-stakes testing, of course, and this is yet another controversy that this chapter cannot solve. Mitchell (2006) wrote a review of the evidence for The Center for Public Education (an online publication of the National School Boards Association) that was more favorable, although it began with a rather strong disclaimer: "Although there are many articles on high-stakes testing, only a few qualified for our consideration because most did not report empirical research. As is often the case with research on educational topics, the research on the responses to high-stakes tests needs to be approached with judgment and caution. Above all it needs to be approached with an open mind. Research does not give us the definitive answers we seek, rather it provides us with tools to arrive at our own conclusions."
- ⁶ According to a recent poll, "Three-quarters of public school teachers surveyed support the Common Core State Standards, yet just 27 percent said their district has provided them with the tools and resources necessary to teach the standards" (American Federation of Teachers. 2013, p. 1).

REFERENCES

- Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Boulder, CO: Westview.
- Ambrose, D. (2011). An interdisciplinary flight over dogmatic socioeconomic, political, ideological, and cultural terrain. In D. Ambrose & R. J. Sternberg (Eds.), *How dogmatic beliefs harm creativity and higher-level thinking* (pp. 64–76). New York, NY: Routledge.
- Ambrose, D. (2016). Twenty-first century contextual influences on the life trajectories of creative young people. In D. Ambrose & R. J. Sternberg (Eds.), *Creative intelligence in the 21st century: Grappling with enormous problems and huge opportunities* (chapter 2, this volume). Rotterdam, The Netherlands: Sense Publishers.
- Amrein, A. L., & Berliner, D. C. (2003). The effects of high-stakes testing on student motivation and learning. *Educational Leadership*, 60(5), 32–38.
- American Federation of Teachers. (2013, May). *AFT poll of 800 teachers finds strong support for Common Core Standards and a moratorium on stakes for new assessments until everything is aligned* (Press Release). Retrieved from <http://www.aft.org/newspubs/press/2013/050313.cfm>

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- Ariely, D. (2011). Want to stop teachers from cheating? A history lesson from corporate America. *Washington Post*. Retrieved from http://www.washingtonpost.com/national/on-leadership/want-to-stop-teachers-from-cheating-a-history-lesson-from-corporate-america/2011/07/18/gIQAtEbtLI_story.html
- Baer, J. (1997). Gender differences in the effects of anticipated evaluation on creativity. *Creativity Research Journal*, 10, 25–31.
- Baer, J. (1998). Gender differences in the effects of extrinsic motivation on creativity. *Journal of Creative Behavior*, 32, 18–37.
- Baer, J. (1999). Creativity in a climate of standards. *Focus on Education*, 43, 16–21.
- Baer, J. (2002). Are creativity and content standards allies or enemies? *Research in the Schools*, 9(2), 35–42.
- Baer, J. (2003). Impact of the core knowledge curriculum on creativity. *Creativity Research Journal*, 15, 297–300.
- Baer, J. (2012). Unintentional dogmatism when thinking big: How grand theories and interdisciplinary thinking can sometimes limit our vision. In D. Ambrose & R. J. Sternberg (Eds.), *How dogmatic beliefs harm creativity and higher-level thinking* (pp. 157–170). New York, NY: Routledge.
- Baer, J. (in press). *Domain specificity in creativity*. San Diego, CA: Elsevier/Academic Press.
- Baer, J., & Kaufman, J. C. (2013). *Being creative inside and outside the classroom*. Rotterdam, The Netherlands: Sense Publishers.
- Beghetto, R. A., & Kaufman, J. C. (2007). Toward a broader conception of creativity: A case for “mini-c” creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 1, 13–79.
- Beghetto, R., Kaufman, J., & Baer, J. (2015). *Teaching for creativity in the common core classroom*. New York, NY: Teachers College Press.
- Bush, G. W. (2009, January 8). *Remarks on the no child left behind act*. Retrieved from <http://www.presidency.ucsb.edu/ws/?pid=85420> and <http://www.presidency.ucsb.edu/ws/index.php?pid=85420&st=charter+school&st1=>
- Clarke, L. K. (1988). Invented versus traditional spelling in first graders’ writings: Effects on learning to spell and read. *Research in the Teaching of English*, 22, 281–309.
- Conti, R., Collins, M. A., & Picariello, M. L. (2001). The impact of competition on intrinsic motivation and creativity: Considering gender, gender segregation and gender role orientation. *Personality and individual differences*, 31(8), 1273–1289.
- Cropley, D. H., Cropley, A. J., Kaufman, J. C., & Runco, M. A. (Eds.). (2010). *The dark side of creativity*. New York, NY: Cambridge University Press.
- Diehl, M., & Stroebe, W. (1991). Productivity loss in idea-generating groups: Tracking down the blocking effect. *Journal of Personality and Social Psychology*, 61, 392–403.
- Duncan, A. (2011, July 11). Despite cheating scandals, testing and teaching are not at odds. *Washington Post*. Retrieved from http://www.washingtonpost.com/national/on-leadership/despite-cheating-scandals-testing-and-teaching-are-not-at-odds/2011/07/19/gIQADU3NI_story.html
- Eisenberger, R., & Cameron, J. (1996). Detrimental effects of reward: Reality or myth? *American Psychologist*, 51, 1153–1166.
- Eisenberger, R., & Rhoades, L. (2001). Incremental effects of reward on creativity. *Journal of Personality and Social Psychology*, 81, 728.
- Eisenberger, R., & Shanock, L. (2003). Rewards, intrinsic motivation, and creativity: A case study of conceptual and methodological isolation. *Creativity Research Journal*, 15, 121–130.
- Harris, D. N. (2011). *Value-added measures in education: What every educator needs to know*. Cambridge, MA: Harvard Education Press.
- Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The four C model of creativity. *Review of General Psychology*, 13, 1–12.
- Heinlein, L. M., & Shinn, M. (2000). School mobility and student achievement in an urban setting. *Psychology in the Schools*, 37, 349–357.
- Mitchell, R. (2006). *High-stakes testing and effects on instruction: Research review*. Retrieved October 20, 2014, from <http://www.centerforpubliceducation.org/Main-Menu/Instruction/High-stakes-testing-and-effects-on-instruction-At-a-glance/High-stakes-testing-and-effects-on-instruction-Research-review.html>

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- Mullen, B., Johnson, C., & Salas, E. (1991). Productivity loss in brainstorming groups: A meta-analytic integration. *Basic and Applied Social Psychology, 12*, 3–23.
- Mumford, M. D. (2003). Where have we been, where are we going? Taking stock in creativity research. *Creativity Research Journal, 15*, 107–120.
- Nijstad, B. A., Stroebe, W., & Lodewijckx, H. F. M. (2003). Production blocking and idea generation: Does blocking interfere with cognitive processes? *Journal of Experimental Social Psychology, 39*, 531–548.
- Persaud, R. (2007). Why teaching creativity requires more than just producing more ‘creativity’. *Thinking Skills and Creativity, 2*(1), 68–69.
- Ravitch, D. (2011). *The death and life of the great American school system: How testing and choice are undermining education*. New York, NY: Basic Books.
- Reilly, R. C. (2008). Is expertise a necessary precondition for creativity? *Thinking Skills and Creativity, 3*(1), 59–76.
- Rickards, T. (1999). Brainstorming. In M Runco & S Pritzker (Eds.), *Encyclopedia of creativity* (Vol. 1, pp. 219–228). San Diego, CA: Academic Press.
- United States General Accounting Office. (1994). *Elementary school children: Many change schools frequently, harming their education* (GAO/HEHS-94-45, pp. 1–55). Washington, DC: Health, Education, and Human Services Division.
- Weisberg, R. W. (2006). Expertise and reason in creative thinking: Evidence from case studies and the laboratory. In J. C. Kaufman & J. Baer, (Eds.), *Reason and creativity in development* (pp. 7–42). New York, NY: Cambridge University Press.
- Woolfolk, A. (2012). *Educational psychology* (12th ed.). Boston, MA: Allyn and Bacon.