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Teaching for Creativity in an Era of Content Standards
and Accountability

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INTRODUCTION

Teaching for creativity and teaching specific content knowledge need not be in opposition, as is often feared by educators. Creative thinking actually *requires* significant content knowledge, and thinking creatively about a topic helps deepen one's knowledge of that topic. Many creativity-relevant skills, such as divergent thinking, can be used in ways that increase both creativity and knowledge of specific content. There are also ways to make use of rewards and evaluations judiciously that will allow teachers to help students become more creative thinkers and also acquire important domain-specific skills and content knowledge. This chapter summarizes relevant research to provide a theoretical framework and describes specific classroom techniques that promote both creativity and the acquisition of content knowledge.

MUST CONTENT STANDARDS AND ACCOUNTABILITY
BE IN CONFLICT WITH CREATIVITY?

The past two decades have seen a major and unrelenting call for more testing of students and more explicit and more detailed content standards that form the framework for such assessment. Although No Child Left Behind legislation has played a prominent role in recent educational policy formulations, federal mandates have not been the only force pushing for greater accountability (Fuhrman, 2001; Ladd, 1996). This movement includes both state initiatives and nongovernment, nationwide efforts like the Core Knowledge Foundation's Core Knowledge Sequence (Core Knowledge Foundation, 1998; Hirsch, 1987, 1991–1997, 1996). We will not argue the merit (or lack of merit) of an increasing reliance on standardized testing or the wisdom of fine-grained, grade-by-grade content standards. That debate is ongoing, and for the moment we will take the current situation, and a near-term future that seems to be heading toward ever more explicit content standards, as a given that any educational goals or

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activities must acknowledge and, to some extent at least, accommodate. We will argue that these initiatives (both the focus on explicit and detailed content standards and the standardized test-based accountability to which these standards are often closely linked) need not doom the teaching and promotion of creativity in the classroom. Teaching for creativity and detailed required content standards can coexist quite comfortably, and although they may seem at times to be working at cross purposes (and, indeed, this is sometimes the case), they just as often work synergistically, such that teaching for creativity helps meet content standards goals and teaching detailed content knowledge can reinforce and enhance student creativity.

At first glance, creativity and accountability do appear to be at odds. Most educators readily associate creativity with divergent thinking (coming up with many possible ideas in response to an open-ended prompt). For example, Woolfolk (2001) noted that “encouraging creativity in a classroom means to accept and encourage divergent thinking” (p. 102). They may also associate accountability with convergent thinking (finding a single correct or best answer to a problem) and/or evaluative thinking (judging whether an answer is accurate, consistent, or valid). The concepts of divergent, convergent, and evaluative thinking originated in Guilford’s Structure of the Intellect Model, and because divergent thinking is widely believed to be an important component of creative thinking, the improvement of divergent thinking skills has often been the goal of creativity training (Baer, 1997a; Guilford, 1956; Woolfolk, 2007). In addition, the most widely used tests of creativity – the Torrance Tests of Creative Thinking – are actually not tests of creativity but rather tests of divergent thinking (Kim, 2006; Torrance, 1966, 1974, 1998; Torrance & Presbury, 1984). So these common associations are not unexpected.

But creativity is not just about divergent thinking; it also requires evaluative and convergent thinking, as well as a great deal of domain knowledge and skills (Kaufman & Baer, 2006; Runco, 2003; Simonton, 1999, 2006). For example, one of the best studied and most influential models of creativity, Campbell’s blind-variation and selective-retention model, requires a combination of chance variation to produce new ideas (divergent thinking) and selective retention of more workable ideas (evaluative and convergent thinking) to produce creative breakthroughs (Campbell, 1960; see Simonton, 1994, 1998, and 2004 for more recent versions of this model). The Creative Problem Solving (CPS) model, which may be the most well-validated practical approach to creativity enhancement on the level of more everyday creativity and problem solving, also requires both divergent thinking and evaluative judgment as part of each and every step in the process (Baer, 1987a, 1997a; Isaksen & Treffinger, 1985; Puccio, Murdock, & Mance, 2007; Treffinger, Isaksen, & Dorval, 2006). So, although divergent thinking might be the first thing to come to mind when one thinks of creative thinking, it is not all there is to creativity; judgment, evaluation, skills, and knowledge all play important roles.

Creativity and content knowledge and skills are not (or need not be) orthogonal variables. They interact, and creativity is dependent on domain knowledge and skills. Nonetheless, the pressures of accountability and testing naturally affect the ways teachers teach, and one common fear is that creativity may be lost in the shuffle (Baer, 1999, 2002; Beghetto & Plucker, 2006; Fasko, 2001).

The effort to devise and implement detailed content standards has had many critics, many of whom have charged that attention to such content standards will detract from student thinking and creativity. Several have suggested that adherence to content standards like those exemplified by the Core Knowledge Sequence will result in the unthinking, uncritical, and uncreative absorption of knowledge (Orwin & Forbes, 1994; Schear, 1992; Vail, 1997). One critic called students in Core Knowledge schools “informational blotters” (Paul, 1990, p. 431) and claimed that these students would be able to do very little interesting or productive thinking with the knowledge that they obtained in Core Knowledge schools. There is a sense among many educators that the push for stricter content standards will decrease the amount of time teachers can allocate to the teaching of thinking skills. There is also a concern that content standards will encourage teachers to limit their instruction to that which will be tested (Jones, Jones, & Hargrove, 2003; Olson, 2000, 2001; Tucker, 2002).

We cannot deny that this happens. But there is significant evidence that the introduction of explicit content standards does not lessen students’ creativity; in fact, it may do just the opposite. In the one large study ($N = 540$) to date that has looked directly at this issue (Baer, 2003), students in Core Knowledge middle schools had as high or higher creativity ratings than matched students in non-Core Knowledge middle schools. This study looked at actual performances of students on creativity-relevant tasks (such as writing stories and poems), not simply scores on divergent thinking tests. Contrary to the predictions of critics like Paul (1990), students in schools with detailed content standards and a strong focus on teaching to those content standards were not less creative than similar students in schools with less-detailed content standards. They were several creativity measures in this study, and on some of the measures, the Core Knowledge students were judged to be more creative, while on others, there was no statistically significant difference between the two groups. In none of the creativity assessments was the Core Knowledge group judged to have lower creativity than the matched non-Core Knowledge group.

The possibility that teaching for creativity and emphasizing content knowledge may be in conflict is part of the larger question about the relationship between learning content and learning to think more effectively (see, e.g., Chi, Glaser, & Farr, 1988; Feldhusen, 2006; Glass & Holyoak, 1986; Hirsch, 1996; Johnson-Laird, 1983; Karmiloff-Smith, 1992; Kaufman & Baer, 2006; Mayer,

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2006; Paul, 1990; Chase & Simon, 1973; Woolfolk, 2007). It is also related to questions about the possibilities of transfer of learning and of teaching to promote such transfer (see, e.g., Gage & Berliner, 1992; Mayer, 1987; Perkins & Salomon, 1988; Salomon & Perkins, 1989; Woolfolk, 2007). It has become increasingly clear that thinking depends quite heavily on knowledge, that mistakes in everyday critical thinking are more often the result of faulty premises (i.e., incorrect factual knowledge) than a lack of general problem-solving skills, and that teaching for transfer requires a great deal of context-specific training or practice in any domain to which transfer is desired (Ashcraft, 1989; Baer, 1993, 1996; Kaufman & Baer, 2006; Weisberg, 1988, 1999, 2006; Willingham, 2001; Woolfolk, 2007). It seems that content knowledge is essential to serious thinking, that teaching content-free thinking skills is not possible, that higher-level thinking requires the automatization of lower-level skills, and that to improve students' thinking in a given domain, students must acquire an understanding of much factual content about that domain as well as a variety of domain-specific cognitive skills.

So we must teach students content knowledge if we want to improve their thinking. Conversely, often the best way to teach content knowledge is to get students to think about it in some way – to become actively engaged with the content to be learned (Ashcraft, 1989; Craik & Lockhart, 1972; Hirsch, 1987, 1996; Lockhart & Craik, 1990; Mayer, 1987; Woolfolk, 2007; Zimbardo & Gerrig, 1999). Being actively engaged with the content to be learned means being actively engaged *cognitively*, of course. Simply being physically active or emotionally engaged is not what is required (and may even get in the way of meaningful cognitive engagement). An emphasis on the acquisition of content knowledge does not conflict with an emphasis on active processing of information; in fact, the former requires the latter.

For these reasons, an emphasis on content standards need not hinder those who wish to emphasize the development of students' thinking skills, and this is true for creativity just as it is for other kinds of thinking. Having richer and more extensive content knowledge and skills should support, not detract from, creative thinking, just as such knowledge and skills support other kinds of thinking. There is a consensus among creativity researchers and theorists that creative genius in particular requires extensive content knowledge (Gruber, 1981; Gruber & Davis, 1988; Simonton, 1994, 1998, 1999, 2004, 2006; Weisberg, 1988, 1999, 2006), and there is much evidence to support what has come to be known as the “ten-year rule,” which claims that it generally takes at least ten years of extensive work and/or study in a field before truly creative work is even possible (see, e.g., Chase & Simon, 1973; Hayes, 1989; Kaufman & Baer, 2002; Weisberg, 1999).

This is not to suggest that all is well and that there is no conflict between content standards (and test-based accountability) and teaching for creativity. There are very real problems, problems that are in most cases avoidable, but

very real problems because they are often not avoided. In fact, teachers' misperceptions of how best to meet accountability standards often result in the worst possible outcomes: lower test scores and lessened creativity. Teachers who feel pressured to raise test scores may drop anything resembling divergent thinking from their lesson plans. They may also emphasize rote memorization at the expense of thinking about and understanding the content they are teaching. But dropping divergent thinking activities and focusing on memorization is not only bad for creativity – it is also bad for the acquisition of skills and content knowledge. As will be argued later, the most effective ways to teach skills and content knowledge often involve the very same activities one would emphasize to promote creative thinking. When teachers banish divergent thinking and replace it with rote memorization, they are creating the worst of all possible educational worlds, one in which both creativity and content knowledge suffer. Although there are situations in which these two goals are at odds, they are more often synergistically linked. More creativity will often lead to more content knowledge, and more content knowledge will generally lead to more creativity. But there are a few bumps on the road to this educational nirvana, which we will explain.

HOW TO EMPHASIZE ACQUISITION OF SKILLS AND CONTENT KNOWLEDGE AND ENHANCE CREATIVITY

Teaching Divergent Thinking

The most widely used teaching techniques for improving student creativity are brainstorming activities (e.g., “List as many different possible uses for a brick as you can” or “How many different ways can you think of to get people to use less petroleum?”). The rules of brainstorming are fairly simple:

- *Defer judgment.* The goal of brainstorming is to come up with unusual and original ideas. When ideas are being judged, most people will take fewer risks and self-censor many ideas. Judgment can come later, after all the ideas are on the table. This includes both negative judgments and positive ones.
- *Avoid ownership of ideas.* When people feel that an idea is “theirs,” egos sometimes get in the way of creative thinking. They are likely to be more defensive later when ideas are critiqued, and they are less willing to allow their ideas to be modified.
- *Feel free to “hitchhike” on other ideas.* This means that it is okay to borrow elements from ideas already on the table or to make slight modifications of ideas already suggested.
- *Wild ideas are encouraged.* Impossible, totally unworkable ideas may lead someone to think of other, more possible, more workable ideas. It is easier

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to take a wildly imaginative bad idea and tone it down to fit the constraints of reality than to take a boring bad idea and make it interesting enough to be worth thinking about (Baer, 1997a, p. 43).

There are many programs designed to enhance creativity that are used in schools, such as Synectics (Gordon, 1961), Talents Unlimited (2009), CPS (Eberle & Stanish, 1980), and the Odyssey of the Mind creative problem-solving competition (formerly known as the Olympics of the Mind; Micklus, 1986; Micklus & Micklus, 1986). In all these programs, the development of divergent thinking skills is paramount and brainstorming (or a variant of brainstorming) is used as a primary tool for encouraging and improving divergent thinking. Brainstorming can be used as part of a broader program of creativity training (as in CPS), or it can stand alone as a way to improve divergent thinking.

For many teachers, these kinds of divergent thinking activities are both fun and worthwhile, but not essential – and there certainly are not going to be any divergent thinking questions on the state’s standardized assessments of student learning. When accountability push comes to testing shove, therefore, teachers may be quick to stop asking students to “think of many varied and unusual ways to do X” and use that time to drill math facts or practice reading comprehension strategies.

It is hard to argue with the reasoning behind such a decision. Helping children improve their divergent thinking skills may have long-term value – it may help them become more creative thinkers – but it is hard to see how listing 100 interesting and unusual ways to use egg cartons will help Johnny improve his scores on state-mandated achievement tests.

We agree that daily brainstorming activities using “How many uses can you think of for X?” kinds of questions are probably not a good use of class time. In fact, it is not even clear that such activities will have much impact on students’ creativity, because “unusual uses” kinds of brainstorming activities exercise only a very limited number of divergent thinking muscles. Divergent thinking, like creativity more generally, varies from domain to domain, and even from task to task within a given domain. Doing the same kind of brainstorming activity every day would be rather like going to the gym every day and doing a single exercise, the same exercise, every day. One set of muscles would get stronger, but the rest would atrophy (Baer, 1993, 1996, 1997a, 1998a; Baer & Kaufman, 2005; Kaufman & Baer, 2005).

Using brainstorming only in response to unusual uses kinds of prompts, while perhaps a good way to improve one’s score on a divergent thinking test, is nonetheless a very unimaginative and unproductive way to use brainstorming in the classroom. Even if improving students’ creative thinking were a teacher’s only goal, she or he would still be well advised to use brainstorming in a wide range of contexts and with as diverse a set of prompts as possible. But the benefits of brainstorming need not be limited to improving divergent

thinking skills; they can also be used to help students acquire content knowledge and develop skills. (It is perhaps worth noting that unusual uses kinds of prompts *can* be an excellent choice the very first time a group is introduced to brainstorming, because they are very easy to understand. But after that, one needs to branch out.)

Here is a very simple example of a way to use brainstorming in class to help students learn content knowledge. At the beginning of a lesson, teachers can ask students to brainstorm what they already know about the topic the class is about to study. Let's say a third-grade class is about to read a book about Abraham Lincoln. Students might be asked to brainstorm everything they know about Lincoln, with the teacher recording their responses on the board. (Remember in doing this the *Defer Judgment* rule – If someone says that Lincoln was the first president, the teacher should just write it down, and if another student tries to correct this, she might remind him that time for judging or commenting on the ideas will come later. Judging ideas in the middle of brainstorming will short-circuit the process, because if students worry that their ideas might be criticized they will hold back and take fewer risks expressing ideas about which they might not be fully confident.) Soon the board will be filled with ideas – some correct, some incorrect, some important, some tangential – about Lincoln. What has been accomplished?

1. The students have activated their own background knowledge about Lincoln. It is therefore more likely that the new information they are about to learn will be encoded in long-term memory and linked in a propositional network with other things they know about Lincoln, making it much easier to recall the information later (even on a test!).
2. The students will be learning new things about Lincoln from the ideas offered by other students.
3. The teacher will get a quick reading of what students know about Lincoln, a kind of formative assessment that can help guide the lesson that will follow.
4. The teacher will quickly become aware of misconceptions students may have about Lincoln and have an opportunity to correct these mistaken ideas. Getting those incorrect ideas (such as Lincoln being the first president) on the board provides an opportunity to deal with those misconceptions straightforwardly (but only *after* brainstorming ends). Some such mistaken notions can be corrected easily (e.g., in response to a brainstorming response that Lincoln was the first president, the teacher might explain that “Sometimes students confuse Lincoln, who was president during the Civil War, with George Washington, who was our leader during the Revolutionary War and who later became our first president”). Other misconceptions may be more subtle and better dealt with later in the lesson

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(e.g., it might take a while to explain why the claim that “Lincoln started the Civil War to free the slaves” is not exactly true).

5. Students will get practice doing divergent thinking.

Brainstorming can be used in many other ways to help students develop skills and acquire content knowledge that meet state content standards. Here is an example taken from the New Jersey Core Curriculum Content Standards (New Jersey Department of Education, 2004). Standard 6 states (among other things) that students will be able to “Analyze the impact of various human activities and social policies on the natural environment and describe how humans have attempted to solve environmental problems through adaptation and modification,” “Apply spatial thinking to understand the interrelationship of history, geography, economics, and the environment, including domestic and international migrations, changing environmental preferences and settlement patterns, and frictions between population groups,” and “Analyze why places and regions are important factors to individual and social identity.”

One of us designed a middle-school social studies project some time ago that is directly related to this standard and that uses divergent thinking as a way to learn skills and content while at the same time developing creative thinking skills. Students were asked to create a new continent somewhere on the globe and to explain how this continent might have developed culturally. This was a project that lasted about two weeks with several lessons on different topics along the way, but the general goal was to help students understand how geography and human history interact (e.g., how such things as climates, landforms, and natural resources influence how people live and how the ways people live are adapted to their differing geographical settings).

The unit started off with some exercises designed to improve some divergent thinking skills that students might find useful as they worked on the project. Here are three abilities that were thought were important and that would help them make their projects more creative:

1. Ability to think of specific cultural elements that might be influenced by geography
2. Ability to think of ways that geography might influence general features of a culture
3. Ability to think of ways that a society’s culture might lead them to adapt different geographical elements to a given purpose

Each of these provided the content for a brainstorming exercise. For example, after learning what the expression “specific cultural elements” means, students brainstormed and created lists of things that might count as cultural elements. Later they brainstormed cultural elements that might be influenced

by geography. Evaluation of their ideas can follow these brainstorming sessions, providing another chance to grapple with important knowledge and skills. These activities – and similar activities related to abilities 2 and 3 above – were designed to increase students' divergent thinking skill in these particular social studies content areas. Development of these particular divergent thinking skills supported the larger create-a-continent activity, and it also addressed New Jersey Core Curriculum Content Standard 6.9. (For more information on other divergent thinking activities that support various curricular objectives, see Baer, 1997a.)

Balancing Intrinsic and Extrinsic Motivation

Teaching for creativity and teaching for content tend to go in opposite directions when it comes to motivation. (Recall that at the beginning of this paper we acknowledged that at times creativity and content standards really *do* work at cross purposes.) Student motivation is one place that is particularly true, as will be explained. But the situation is not hopeless.

Amabile's (1983, 1996) intrinsic motivation theory has been one of the most powerful and productive ideas to come out of the last quarter century of creativity research. This theory states that people are more creative when they do something simply because they find it intrinsically interesting – because it is something they have chosen to do just because they derive pleasure, or even joy, from doing it – and they are less creative when they do something because they are extrinsically motivated, such as to earn a reward.

This idea probably seems pretty harmless, but it is not just saying that being intrinsically motivated leads to more creative behavior. It is also saying that when people do things to earn rewards, or when they expect that their work will be evaluated, they become *less* creative; and when they do things primarily to please someone else, they also become less creative. It is somewhat distressing to many teachers to hear that the things they do everyday – offer rewards to students (that is, bribe students to do things they might not do otherwise) and evaluate their work – tend to decrease students' creativity. But troubling though it may be, it is nonetheless true.

Intrinsic and extrinsic motivation tend to compete with each other, and when we experience both at the same time, extrinsic motivation tends to drive out intrinsic motivation. When a teacher offers students rewards for doing things, or when they evaluate their students' work, they do indeed increase their motivation – their extrinsic motivation – but at the same time they are diminishing their students' intrinsic motivation for those activities. And by reducing intrinsic motivation, they are also causing their students to be less creative. (For more information about this theory and the evidence supporting it, see Amabile, 1993, 1996; Hennessey & Amabile, 1988; Hennessey & Zbikowski, 1993. The negative impact of extrinsic motivation on creativity

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is especially powerful for girls; see Baer, 1997b, 1998b.) But we must evaluate students' work – if for no other reason (and there are other and better reasons, to be discussed later) because we must give grades of some kind. And sometimes if we could not offer rewards – if we could not bribe students – we simply would not be able to get them to do some things that they really need to do. For better or worse, some of the same things that we know tend to diminish creativity are the very things that tend to increase competence. Students *need* feedback (a.k.a. evaluation) on their performance if they are to improve their skills, and they sometimes need some kind of extrinsic motivation – rewards – to keep working when they would otherwise simply stop. They need extrinsic motivation to learn, and teachers need extrinsic motivation (bribes and evaluations) to teach them. And so teaching for creativity and teaching to learn content do seem to part company when it comes to motivation. This sometimes forces us to make difficult choices.

One way out of this fix would be to argue that even though doing something for a reward, or working harder because one wants to earn a better evaluation, may lower one's creativity in the short run, it is this extrinsically motivated learning that makes it possible to acquire the skills and knowledge that one will need in the future to do something in a more creative way than would be possible at present. The skills and knowledge that our students are acquiring (with the help of evaluation and occasional rewards) will allow them to be more creative in the future, because they will need considerable amounts of both skills and knowledge to do anything truly creative. And this is true. But it is only one part of the story. The other part – the intrinsic motivation–reducing effects of evaluation and rewards – does not just go away because they may also have some other positive effects. And if students lose their intrinsic motivation, they may have the skills and knowledge they need to be creative, but they may no longer have any interest in doing anything creative with those skills and that knowledge. And if you do not do anything, you do not do anything that is creative.

Teachers thus find themselves between a rock and a hard place, needing evaluations and rewards but knowing they also have negative effects. The way out of this dilemma is first to keep in mind one's goals for a given lesson. If one's focus is on skill development or knowledge acquisition, then one needs to use extrinsic motivation and (at least temporarily) risk depressing creativity. To the extent that evaluation is viewed by students as empowering, there is even some evidence that it may not negatively affect creativity at all (Eisenberger, Pierce, & Cameron, 1999; Eisenberger & Rhoades, 2001; Eisenberger & Shanock, 2003); if the focus is on the student's work (rather than on the student's abilities), this should also lessen the negative impact (Amabile, 1983, 1996). But the fact that under some conditions and for some students the creativity-dampening, intrinsic motivation–killing effects of rewards and evaluations might be mitigated does not mean there are no negative effects. They are real and they should not be ignored.

Sometimes a teacher's goal is not skill development, however. For some lessons or activities, the primary goal may well be to encourage both intrinsic motivation and creativity, and in those cases one needs to avoid doing things that will increase extrinsic motivation and try to do whatever one can to increase intrinsic motivation. For example, when teaching writing, we want students to learn a number of skills, and sometimes we want them to write imaginatively. These goals are sadly at odds because one requires an emphasis on extrinsic motivation – evaluative feedback, in this case – and the other just the opposite (a focus on intrinsic motivation, which would require one to avoid evaluation). If one tries to do a little of each, it will not work, because extrinsic motivation will win – it will tend to drive out students' intrinsic motivation. But a teacher can do both if she does them at *different times*. When working on skill development in writing, she can let students know the criteria or rubric she will use to evaluate their work (to promote skill development), and at other times she can tell them that although they must do the writing assignment, they will get credit simply for doing it and there will be no further evaluation (to promote intrinsic motivation and creativity). Teachers often evaluate work in different ways for different purposes (and may evaluate the same piece of writing in different ways, depending on the stage of the writing process), and it is appropriate to evaluate different aspects of students' performance when emphasizing different goals. Consider, for example, how for very young writers it may be helpful at some times to ignore spelling errors and have students use invented spelling rather than have them completely shut down every time they need a word they cannot spell, while at other times it is better to teach spelling directly and expect students to learn to spell the words that they have studied correctly. Teachers using this strategy can emphasize both correct spelling and fluency in writing, but at different times, with the long-term goal of both fluent and correct writing (Bank Street College, 1997; Burns, Griffin, & Snow, 2000).

Some teachers object that this is unrealistic and students will not believe it anyway, but if one actually follows through on the promise not to evaluate, students will (gradually) come to believe this promise. This will allow them to concentrate on skills and focus on doing things "right" when they expect evaluation and it will free them up to write more imaginatively (albeit often with less technical correctness) when the no-evaluation promise is in effect. One cannot simultaneously make extrinsic and intrinsic motivation salient (because extrinsic motivation will win and drive out intrinsic motivation), but one can do both at different times. This allows both skill development and a nurturing of interest in creative writing.

Will some kids abuse the license that a no-evaluation promise provides? Of course they will. But sometimes we need to allow the students who want to do as little as possible to get away with it, in order not to punish those students who do have the kind of intrinsic motivation that we wish all our students had.

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But what about content standards and accountability? Will this take time away from learning content? Probably so. (Remember, sometimes content standards and accountability *do* come into conflict with creativity. There is no free lunch here.) But probably not as much as one might fear. If students spend a few hours each week doing activities that will not be evaluated but which will be likely to increase students' intrinsic motivation, it will not take a huge amount of time away from learning the content knowledge on which they will be tested, and these activities may help students acquire important content knowledge and skills, even without evaluations or rewards, simply because they allow and encourage students to think about that content knowledge and apply those skills in different, and sometimes even original, ways. Thinking deeply about content is a highly effective way to retain it – more effective in the long term than many short-term strategies like flashcards – so teacher might think of divergent thinking or other creativity-relevant activities as investments in their students' long-term acquisition of content knowledge (Woolfolk, 2007). In addition, these kinds of activities may simply help getting students to show up in class – psychologically as well as physically. And without that, all the great content knowledge and skill-focused lessons cannot do them any good anyway.

Using Both Teacher-Centered and Student-Centered Learning

There are many continua on which different teaching approaches can be located, such as constructionist/transmissive, progressive/traditional, and teacher-centered/student-centered. These are at best fuzzy guides because it is often on the most extreme cases that are easy to classify, but they are often used to describe different teaching approaches.

Schuh (2003), an advocate of student-centered and constructivist teaching, defines the teacher-centered/student-centered distinction in a way that also encompasses the constructivist-transmissive and progressive-traditional continua:

In a teacher-centered model of instruction, the instructor's role is seen as imparting knowledge to students, and instruction proceeds from the instructor's point of view. . . . The teacher decides for the learner what is required . . . by defining characteristics of instruction, curriculum, assessment, and management . . . in which the information . . . is moved into the learner. . . . In contrast, learner-centered instruction (LCI) fosters opportunities for learners to draw on their own experiences and interpretations. . . . LCI proposes that teachers need to understand the learner's perspective and must support capacities already existing in the learner to accomplish desired learning outcomes. Learning goals are then achieved by active collaboration between the teacher and learners who together determine what learning means and how it can be enhanced within each

individual learner by drawing on the learner's own unique talents, capacities, and experiences . . . (p. 427, quoted in Beghetto & Plucker, 2006, pp. 319–320).

Student-centered (also known as learner-centered) approaches have been associated with creativity (Beghetto & Plucker, 2006; Fasko, 2001), although this is a prediction, not a tested empirical claim. It is not difficult to see why teaching for creativity seems to fall into the student-centered side of this continuum. How can an idea be new or original – how can it be creative? – if it has been “moved into the learner” by an outside force (the teacher)? It is perhaps almost as obvious why teaching students content knowledge – the stuff of state content standards and the stuff that will be on the state-mandated tests – seems to fall on the teacher-centered instructional side (certainly it is the state, and its employee, the teacher, who “decides for the learner what is required”).

What often gets lost when thinking about student- and teacher-centered instruction (and similar schemes for comparing modes of instruction) is that this is a continuum, not a dichotomy. Most teachers do not use exclusively the rote memorization strategies that are typically invoked when teacher-centered instruction is attacked (see, e.g., Jones, Jones, & Hargrove, 2003, who argue that high-stakes testing leads to more teaching via rote memorization in schools serving low-scoring, disadvantaged populations, but see also the review by Pletka, 2005, of their book, which contends that they provide no statistics to support this assertion). Similarly, most teachers do not use the pure discovery, unguided, or minimally guided instructional approaches that Kirschner, Sweller, and Clark (2006) have shown to be significantly “less effective and less efficient than instructional approaches that place a strong emphasis on guidance of the student learning” (p. 75) – that is, more teacher-centered approaches.

Teachers are more likely to use techniques that fall at neither extreme of this continuum but rather use approaches that fall closer to the middle (or to use a mix of approaches). There is a conservatism in teaching that results in teachers rarely adopting the more extreme stances of reformers (Kennedy, 2006). There is certainly reason for the concerns raised by Jones, Jones, and Hargrove (2003) that accountability concerns may lead teachers to adopt ineffective teaching methods, because rote memorization is not only bad for creativity – it is also a poor way to learn content (Woolfolk, 2007). As Beghetto and Plucker (2006) contend in their plea that creativity not be forgotten in our schools:

We argue that student understanding develops from a balance between the pursuit of efficient methods to attain viable solutions *and* opportunities to engage in the creative process of developing the personal knowledge of when, why and how to arrive at those solutions. This includes allowing

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students the time and experiences necessary to develop an understanding of what those solutions mean in the context of the particular problem as well as a more general set of problems. Conversely, when teachers simply teach the most efficient method they may actually short-circuit the creative process necessary for the development of meaningful understanding. Again, this is not to say that students should never be taught the most efficient method, but rather they should be given opportunities to work through the problems in their own way such that they develop an accurate yet personally meaningful understanding (p. 324).

As with divergent thinking, so it is with teacher-centered versus student-centered learning. The most effective way to teach for the knowledge and understanding that will result in good scores on state accountability measures dovetails quite nicely with effective methods for teaching for creativity. Misunderstanding how students learn (and going to either extreme of the teacher- or student-centered continuum) will result in both less skill and knowledge acquisition and less student creativity.

Teaching for creativity in an era of content standards does, at times, force teachers to make difficult choices, as the section on intrinsic and extrinsic motivation described. But if teachers avoid (1) mistaken notions that teaching academic skills and content knowledge requires them to abandon creativity-relevant skills like divergent thinking or (2) retreating into rote memorization strategies that drain learning of meaning, they can successfully meet both accountability standards and promote creativity in their classrooms.

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