

Classroom contexts for creativity

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Various factors influence the development of creative potential, including everything from individual differences to the kinds of experiences and opportunities that creators experience throughout the lifespan. When it comes to nurturing creativity in the classroom, the learning environment is one of the most important factors – determining, in large part, whether creative potential will be supported (or suppressed). In short, classroom context matters. It is one thing to recognize that the classroom environment impacts the development of creative potential, it is quite another to understand just what it takes to develop an optimally supportive creative learning environment. This is because many of the features of optimal learning environments are quite subtle and even counterintuitive. In this paper, we discuss insights from the research on how teachers might establish a creativity-supportive learning environment in their classroom.

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How might teachers support the development of students' creative potential? This is a longstanding question in the field of creativity studies (Barron, 1969; Guilford, 1950) and has received renewed interest amongst educational policy-makers, business leaders, and government officials (Beghetto & Kaufman, 2013). Indeed, helping students develop their capacity to think creatively has long been viewed as one of the best, yet often neglected, ways to prepare students for an uncertain future (Dewey, 1897; Guilford, 1950; Vygotsky, 1967/2004; Warnock, 1978).

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There has been growing recognition that nurturing students' creative potential is a valuable, yet often unrealized, educational goal. One reason is because life in the digital age is viewed as more uncertain than ever (Craft, 2011). Another reason is because there have been highly publicized concerns that creativity is “in crisis¹” in American schools and classrooms (Bronson & Merryman, 2010). Some commentators have gone as far as to claim that schools kill creativity (Robinson, 2006) and educational mandates have resulted in “creaticide” (Berliner, 2011).

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We take a more moderate position. Although we agree that creativity is an important skill that can help students navigate uncertain futures (Craft, 2011), we also believe that there is a time and a place for creativity (Kaufman & Beghetto, 2013). Moreover, although we agree that creativity is often neglected in school and can be (inadvertently) suppressed, it is not something that can be killed. Creativity is an inherent part of the everyday human experience. Certain conditions make it more or less likely to be expressed, but human creativity is resilient. It can bounce back even from seemingly systematic efforts to suppress it (see Torrance, 1970; Torrance & Gupta, 1964).

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It is, therefore, important to understand what factors make it more or less likely that students will share and develop their creative potential. This brings us back to our opening question: how might teachers' support the development of students' creative potential? Admittedly, there are no easy answers to this question. Various factors influence the development of creative potential, including everything from individual differences to the kinds of experiences and opportunities that creators have throughout their lifespan (Sternberg, Grigorenko, & Singer, 2004). When it comes to nurturing creativity in the classroom, however, the learning environment is one of the most important factors – determining, in large part, whether creative potential will be supported (or suppressed). In short, classroom context matters.

It is one thing to recognize that the classroom environment impacts the development of creative potential, it is quite another to understand just what it takes to develop an optimally supportive creative learning environment. Indeed, many of the features of optimal learning environments are quite subtle and even counterintuitive. In this paper, we highlight several features of the learning environment that can impinge upon the development of creative potential and offer suggestions for how educators might develop classroom environments more conducive to creative expression.

Understanding creativity

Prior to discussing how learning environments can influence creativity, it is important to first define what is meant by creativity. Most researchers have defined creativity with two key elements that have stayed consistent for more than six decades (see, e.g. Barron, 1955; Guilford, 1950; Stein, 1953). The first pillar of this definition is that creativity must represent something new or different. But novelty is not enough; to be creative, there is also an expectation of task appropriateness or usefulness. Both of these concepts are necessary for something to be creative; Simonton (2012) frames it as $\text{Creativity} = \text{Originality} \times \text{Appropriateness}$. If something is not appropriate or not original then it cannot be considered creative. We would briefly elaborate on this expression to include context: $C = [O \times A]_{\text{context}}$. Highlighting what is considered original or appropriate is determined by a particular social, cultural, and historical context (Plucker, Beghetto, & Dow, 2004).

There are several other suggested conceptualizations of creativity. Rhodes (1961) proposed the Four P's – person, process, product, and press (e.g. environment) – as a framework. Many researchers use the Four P's to understand and examine creativity. Some have extended these Four P's to include *persuasion* (Simonton, 1990) and *potential* (Runco, 2003a), and others have modified the Four P's. Glăveanu (2013), for instance, transformed the Four P's into the Five A's, namely the actor, action, artifact, audience, and affordances (the first three roughly map onto person, process, and product; audience and affordances are two aspects of the creative press).

Another way of approaching creativity research is to focus on the level of creative expression. Many discussions of creativity tend to focus on one of two levels of creativity: everyday (or “little-c”) creativity and genius-level (or “Big-C”) creativity. Kaufman and Beghetto (2009, 2013b; Beghetto & Kaufman, 2007) proposed two additional categories in their Four C Model of Creativity: “mini-c” and “Pro-c.” Mini-c creativity refers to subjective self-discoveries – the new and personally meaningful insights and interpretations that are a component in the learning process. Pro-c creativity is expert-level creativity, which has yet to reach genius status.

If Rodgers and Hammerstein are Big-C-level musical theatre composers, then Jason Robert Brown, composer/lyricist of *Parade*, *The Last Five Years*, and many other Broadway shows, is Pro-c². A local composer/lyricist, who sees his musical produced by the local community theatre, is little-c, and a high school student trying to write a Broadway-style song for the first time might be mini-c. Note that the mini-c insights are not restricted to students. Many top rock composers have decided to write Broadway shows (such as Cyndi Lauper, Elton John, U2, Duncan Sheik, Paul Simon, and Randy Newman), to varying degrees of success. They could easily experience mini-c creativity as they work within this new art form.

The Four C model also offers a developmental framework for understanding creativity (see Figure 1).

As illustrated in Figure 1, mini-c creativity serves as the genesis of later levels of creative expression. That being said, we are not claiming that creative expression always follows a linear progression. Accomplished creators may go directly from Mini-c ideas to Pro-c innovations. Even novices, working alongside an expert companion, can generate mini-c insights that lead to Pro-C contributions. Students working on a project, accompanied by the expertise of a professional scientist can, for example, generate mini-c insights that result in scientific contributions (see Lofing, 2009).

The Four C model can help teachers understand the levels of creative expression most germane to the classroom environment (i.e. mini-c and little-c) and identify key factors necessary for supporting the development of creativity from one level to the next. As illustrated in Figure 1, feedback is one of the most important things in helping shape one's mini-c ideas into little-c contributions that others can appreciate as creative. At the little-c level, deliberate practice is one of the most important factors necessary for progressing from everyday creativity to professional levels of creative accomplishment (Ericsson, 1996). Finally, at the Pro-c level, time is one of the most important factors in attaining legendary, Big-C status. Big-C creativity, as Csikszentmihalyi (1999) has described, is determined in particular domains (such as art) and by gatekeepers of that domain (e.g. critics, curators, collectors, and fellow artists). Big-C creativity is bestowed on creators and creative accomplishments after the passing of much time (and usually the passing of creators themselves).

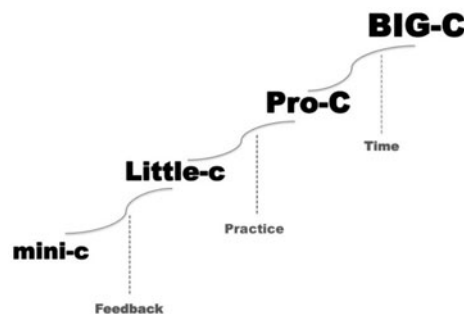


Figure 1. The developmental trajectory of creativity.

Understanding creativity in context

Having a broader understanding of creativity can help teachers recognize that the smaller (mini-c and little-c) levels of creativity are most appropriate to emphasize in their classrooms. Although this recognition is helpful, it does little by way of helping teachers understand how they might actually go about supporting the development of their students' creative potential. Stated more plainly, what is a teacher to do come Monday morning when faced with a class full of students? In our work with teachers, we have discovered that although most teachers appreciate learning about the nature of creativity, they want something concrete. They want techniques. They want something they can use tomorrow in their classroom.

The good news is there are various strategies and techniques that creativity trainers and consultants have developed and used over the years with some more promising than others (Scott, Leritz, & Mumford, 2004). The bad news is that most focus on encouraging divergent thinking (Nickerson, 1999) and nearly all of them are disconnected from the academic subject matter of the classroom. Consequently, most strategies are, at best, a curricular add-on and, at worst, something that seems completely irrelevant to the academic curriculum. Baer and Garrett (2010) perhaps said it best: "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" (p. 11).

That teachers would desire to seek out ready-made techniques is understandable, particularly given all the curricular demands placed on teachers (Ingersoll, 2003). Now that teachers are also being asked to support creative thinking (P21, 2011), it makes sense that they would want techniques that can instantaneously support the development of students' creative potential. Unfortunately, creativity does not develop this way. As Barron (1969) noted decades ago, there is no such thing as "instant creativity" (p. 3) and the desire to seek educational techniques that yield rapid-fire solutions seems to be an outgrowth of the "peculiarly American faith in gadgetry and the application of new forms of energy to speed things up and get the job done" (pp. 2–3). The simple truth is that developing one's creative competence takes time. It takes, by some estimates (Ericsson, 1996), 10 or more years of deliberate practice in a particular domain to become a highly accomplished creator. It may take another 10 years for such a creator to reach his or her peak (Kaufman & Kaufman, 2007).

All of this is not to say that there is nothing that teachers can do to support student creativity. Rather, we would argue that supporting students' creative potential is less about trying to find sure-fire creativity techniques and more about exploring what teachers are already doing that might help or hinder the development of creative potential (Beghetto, 2013). This process includes understanding how students experience the learning environment and helping students learn how to "read the environment" – knowing when (and when not) to be creative (Kaufman & Beghetto, 2013).

In the sections that follow we highlight the importance of understanding how students' experience the learning environment, describe ways that teachers might infuse creativity in their classroom, discuss how students might take charge of their own creativity, and summarize several key reminders for establishing a creativity-supportive classroom environment.

Students, learning environments, and creativity

Although most teachers value creativity, no teacher wants to invite curricular chaos into his or her classroom. Sometimes, when teachers consider creative students, the idea of creativity sounds nice in theory, but not when confronted with the idea of a classroom full of students (Runco, 2007). This is because teachers sometimes believe that highly creative students are also disruptive students (Scott, 1999). We understand that teachers might be concerned about creativity if they view it as a potential disruption.

One way to approach this concern is to recognize that even the most highly creative students express their creativity in different ways. Sometimes highly creative students, like any student, will present curricular and management challenges to teachers. Other times such students will simply display their creativity in different, yet school-appropriate ways. Johnson and Hatch (1990), for instance, found in their case study of highly original children that students' "expressive creative behavior was extremely varied" (p. 222).

One highly original child in the Johnson and Hatch (1990) study, for example, was particularly adept at creating intricate drawings and representational paintings. Another was very skilled at group dramatic play and could tell very elaborate stories based on roughly drawn pictures. Yet another student in the study did occasionally become disruptive, particularly when he was not able to persuade his peers to his way of thinking or when he did not feel like engaging in an activity. Moreover, his teacher suggested to the researchers that his creativity probably accounted for some of his disruptive behavior, explaining that he wanted "to try his own ideas, to move on, to advance forth ... not sit and listen to someone else's opinion" (p. 216). As this study illustrates, highly original students can be disruptive, but they can also be engaged, on-task, and make meaningful, task-appropriate contributions.

The key to remember is that all students have creative potential and express their creativity in some form or another on a daily basis (both in and out of school). The question is not so much about whether creativity has a place in the classroom, but rather when and how creativity can be best supported and encouraged. We will return to this idea, but first we feel it is important to understand what factors support the development of creativity.

What role do individual factors play in the development of creativity?

Creativity researchers have long been interested in identifying factors that account for greater or lesser creative expression. Galton (1869) highlighted three individual factors – capacity, zeal, and vigour – that he believed were most important for one to "make a figure in the world" (p. 84). Galton's focus was more on individual, rather than social or contextual factors.

Following Galton, researchers have continued to explore the role that individual factors play in creativity, including cognitive ability (Jauk, Benedek, Dunst, & Neubauer, 2013; Kim, 2005); personality traits such as openness to experience (Feist, 2010); self-beliefs such as belief in one's creative ability (Bandura, 1997; Beghetto, 2006); task motivation (Hennessey & Amabile, 2010; Renzulli, 2002); knowing when (and when not) to be creative (Kaufman & Beghetto, 2013); and knowing when to defy the crowd (Sternberg & Lubart, 1995).

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Many of these same creativity researchers acknowledge that creativity does not occur in isolation – recognizing that the environment plays a key role in creative expression and the development of creative potential. Much of this work has been conducted in business and laboratory settings (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Hunter, Bendell, & Mumford, 2007), but there has also been a steady line of similar (Hennessey, 2010) and related (Ames, 1992; Kangas, 2010) work conducted in the classroom. Moreover, some of the most prominent theories in the field of creativity studies have taken a confluence approach to creativity – recognizing that creativity emerges from a mix of both individual and social factors (see Amabile, 1996; Amabile & Pillemer, 2012; Csikszentmihalyi, 1999; Sternberg & Lubart, 1995).

What does this all mean for creativity in the classroom? Should teachers pay attention to some factors more than others? We would say that it is important for teachers to recognize that both individual and social factors play a role in student creativity. Students enter the classroom with different interests, different beliefs about their capabilities, and different levels of prior knowledge. All of these individual factors play a role in whether students will be willing to share their mini-c ideas, how they will interpret feedback on those ideas, and whether they will be more or less likely to experience the classroom environment as creativity-supportive.

The beliefs teachers hold about teaching and learning can also influence whether student creativity will be supported or suppressed. Hong, Hartzell, and Greene (2009), for instance, found that teachers who reported using creativity-supportive practices tended to have improvement-focused learning goals, enjoyed creative work, and believed that their teaching went beyond imparting simplistic and factual knowledge.

Being aware of how one's instructional beliefs can influence whether one is likely to use creativity-supportive practices is particularly important given that prior research has demonstrated the benefits, yet seemingly infrequent and inequitable use of such practices (Schacter, Thum, & Zifkin, 2006). Creativity-supportive practices include (a) explicitly teaching for creative thinking, (b) providing opportunities for choice and discovery, (c) encouraging students' intrinsic motivation, (d) establishing a creativity-supportive learning environment, and (e) providing opportunities for students to use their imagination while learning. Schacter et al. (2006) found in their study of 48 teachers that the use of creativity-supportive teaching practices boosted student achievement, but that the majority of the teachers they studied did not implement such practices – this was particularly the case for teachers who taught in classrooms with high proportions of minority and low-performing students.

In sum, understanding creativity in a classroom context requires recognizing that both individual and social factors play a key role in the expression and development of student creativity. Indeed, Niu (2007) found in a study of 357 Chinese high school students that both individual and environmental factors uniquely contributed to students' overall creativity. Niu's findings also highlighted the critical role that social environment played in predicting creativity – accounting for at least as much variance in student creativity as all the other personality characteristics of students.

What role does the learning environment play in the development of creativity?

Prior to discussing the role that the learning environment plays in developing student creativity, we will first provide a definition. Davies et al. (2012) provided a

synthesized definition used specifically for understanding the creative learning environment. That definition describes the learning environment as extending “beyond the physical architecture of the space in which learning takes place ... to encompass psychosocial and pedagogical features ... [and includes] the influence of places and people outside of school” (Davies et al., 2012, p. 80).

Much like factors that influence creativity, the learning environment is shaped by a confluence of features that, in turn, influence student creativity. Davies et al. 2012 summarized the recent research literature (published between 2005 and 2011) focused on identifying factors that support the development of children’s and young people’s creativity. Of the 210 documents they reviewed, only 32 were studies that provided insights into how student creativity is influenced by the physical, pedagogical, psychosocial, and external features of learning environment. We briefly review those insights in the paragraphs that follow.

With respect to the physical environment, Davies and his colleagues report that the flexible use of inside and outside spaces, materials, and time can promote student creativity. The flexible use of the physical environment includes providing time for immersion in school and extracurricular activities and providing open, spacious indoor and outdoor areas that can be used freely and imaginatively by students to move around and make use of in support of their learning and creativity. This also includes making available and incorporating of wide range of resources, materials, and tools in the learning environment – including everything from materials that are malleable (like clay and wire) to more technologically based resources (such as interactive whiteboards).

With respect to the pedagogical and psychosocial features, Davies et al. (2012) report that the use of novel, exciting, and realistic tasks can stimulate students’ creativity. This includes allowing students to have some voice and control over their learning – striking a balance between providing structure and freedom so that students feel supported and encouraged to take the risks necessary for creative expression. This includes taking a more game-like or playful approach to learning – minimizing pressure and allowing for a structured yet more flexible, self-directed learning experience. A creativity-supportive environment is also characterized by an atmosphere of mutual respect between and amongst teachers and students. A creativity-supportive environment also incorporates open dialog and collaborative activities.

Finally, with respect to external partnerships, Davies et al. (2012) note that establishing partnerships with outside organizations and experts can foster creativity. This includes visiting learning spaces such as museums and art galleries and bringing in experts to the classroom from various organizations, business, and agencies. Doing so can increase student engagement, motivation, and creativity.

How might teachers incorporate research-based insights into their everyday classroom?

Although there are many insights that can be drawn from the research on optimal learning environments, we want to highlight two that we feel are particularly important for a classroom context. The first pertains to how particular features of the learning environment tend to be experienced in similar ways by students. Some features tend to support creative expression and others tend to suppress it. Teachers will, therefore, need to try using various blends of the features of optimal learning environments that make the most sense for their particular context. The second

insight pertains to the recognition that any particular student can differentially experience the same learning environment. The same experience that may suppress creativity in the majority of students may support creativity for others. Armed with these two general insights, teachers can start to recognize how they might incorporate these insights into the everyday policies, practices, and procedures of their classroom.

Where might a teacher start? One particularly promising place to start is to understand how one's learning environment can send subtle (and often unintentional) messages to students. These messages emphasize particular reasons for engaging in a learning task and thereby can influence whether students will be willing to take the intellectual risks necessary for creative expression and development. An example (adapted from Beghetto, 2013) may help illustrate.

Imagine a third-grade teacher who, as part of her mathematics curriculum, uses worksheets to provide students with opportunities to practice learning and reinforce their math facts and math problem-solving skills. She recognizes that not all students enjoy completing worksheets. She, therefore, develops what she hopes will transform the task of completing worksheets into a more enjoyable and engaging game. Specifically, the teacher starts by having her students personalize paper cutouts of motorcycles, which will serve as markers of progress during math class.

Each student is asked to put his or her name on the motorcycle cutout, color it, and hang it on a racetrack above the chalkboard for everyone to see. The teacher hands students a worksheet of practice problems. She then announces, "Students who correctly answer the questions on the worksheet in the allotted time will advance their motorcycles one step toward the finish line."

Although the teacher designed this activity to make practice exercises more engaging and enjoyable for her students, it can – somewhat paradoxically – undermine student interest and creativity. One reason is because the activity emphasizes several extrinsic features of the task that can undermine motivation and creative expression (Amabile, 1996; Hennessey, 2010a; Midgley, 2002). These features include externally imposed time constraints, an emphasis on social comparison and competition, and making evaluation salient and public.

With respect to imposed time constraints, researchers have found that deadlines can have a negative impact on intrinsic interest and undermine creative expression. Amabile, DeJong, and Lepper (1976), for instance, demonstrated that deadlines for completing a word game task had an adverse effect on participants' intrinsic interest (as compared to participants who finished the task but did not face such deadlines). It makes sense that students who do not find tasks interesting or enjoyable are more likely to focus their efforts on simply completing the task rather than spend time meaningfully engaging with the task.

Similarly, the imposed time constraints of the motorcycle activity can also communicate to students that quickly converging on correct answers is the most important goal of this task (as doing so is the only way students' motorcycles can advance toward the finish line). Consequently, students can – somewhat ironically – experience the motorcycle activity as more test-like (i.e. quickly churn out correct answers), even though the teacher intended it to be experienced as more game-like (i.e. engage and enjoy the activity). When this situation happens, students are less likely to take the types of intellectual risks that are supportive of meaningful learning and creativity (Beghetto, 2009; Clifford, 1991).

Clifford and Chou (1991), for instance, told Taiwanese fourth graders that they were either playing a game (“play a game to practice your thinking skills”) or taking a test (“take a test to show how good your thinking skills are”). Students who believed they were engaged in a game were significantly more likely to take intellectual risks than students who believed they were engaged in a test-like task.

In the context of the motorcycle activity, the timed nature of the task encourages students to focus their attention on completing as many of the problems as possible in the allotted time. Consequently, the “safe bet” in this task is the “sure bet” – focus your attention on what you can quickly and accurately do and avoid trying something new or challenging, which can result in making mistakes or wasting time.

In addition to the imposed time constraints, the motorcycle math activity also emphasizes competition and expected evaluations – both of which can be detrimental to creativity (Amabile, 1979, 1982; Amabile, Goldfarb, & Brackfield, 1990). Indeed, one of the most problematic aspects of the motorcycle math activity is that it highlights social comparison among students. Concerns about comparisons to others and evaluation pressures can cause anxiety that undermines students’ willingness and capacity for creative expression (Collins & Amabile, 1999; Runco, 2003b; Tighe, Picariello, & Amabile, 2003). This is particularly problematic when comparisons are made in a highly visible fashion (e.g. displaying the progress of math motorcycles on the front chalkboard).

The features of the motorcycle activity can also result in students adopting a performance-avoidant orientation toward math (Ames, 1992; Midgley, 2002). Consider, for instance, the student who has difficulty completing the worksheet during the allotted time. Over several days, the gap between a struggling student’s math motorcycle and the motorcycles of more proficient students will increase in a very visible way. For the student whose motorcycle fails to move (or moves more slowly), the activity can serve as a public reminder that he or she is not as smart, quick, or capable as the rest of the kids in the class. This, in turn, could lead to this student adopting a performance-avoidant orientation toward math.

A performance-avoidant orientation refers to a motivational disposition that students adopt so as to avoid appearing incompetent in the eyes of their teachers or peers (Midgley, 2002). Performance-avoidant students tend to engage in various maladaptive behaviors including avoiding help when needed, withdrawing effort, making public excuses for potentially negative performance in advance of engaging in tasks, and cheating (Maehr & Midgley, 1996; Midgley, 2002). Motivation researchers (Ames, 1992; Midgley 2002) have found that avoidant motivational orientations are, in part, influenced by classroom practices such as the motorcycle activity.

The features of the motorcycle math activity, when taken together, represent a potentially detrimental blending of extrinsic motivators and constraints. Indeed, as Hennessey (2010b) has explained, “the expectation that one’s work will be judged and compared ... may well be the most deleterious extrinsic constraint of all [because] competition often combines aspects of other ‘killers’ of motivation and creativity, including expected reward and expected evaluation” (p. 348).

Regardless of the fact that the teacher intended the motorcycle math activity to be experienced by her students as enjoyable and engaging, there likely will be students who experience the features of this task as demotivating – undermining their willingness to take the risks necessary for creative learning and expression. There may be a myriad of possible shortcuts to be discovered and new pathways towards

solutions to be tested, but these will remain untested if a student perceives the downside (potential public embarrassment) to outweigh the upside (potential public recognition).

We are not arguing that extrinsic motivators should never be used. Indeed, there is evidence that extrinsic motivators can be supportive of creativity (Eisenberger & Cameron, 1998; Eisenberger & Shanock, 2003). There are aspects of the creative process that require persistence or plugging away, and external motivators can be quite helpful at these times. But the important point that is illustrated in this example is that teachers' best intentions to motivate students can sometimes yield unanticipated results.

It is, therefore, important to understand how student creativity tends to be influenced by the learning environment, while also recognizing that not all students will experience the same circumstances in the same way. Trying to understand how each and every student experiences the learning environment presents a daunting (and likely unfeasible) goal for teachers. A more feasible approach, therefore, would involve trying to establish a learning environment that tends to support creative expression (by focusing on internal reasons for engaging in learning) and helping students take control of their creativity.

How can teachers help students take charge of their own creativity?

In addition to understanding and monitoring the motivational messages sent by the classroom environment, another way teachers can cultivate a creativity-supportive environment is to help students learn how to take charge of their own creativity. One way is to help students develop confidence in their own creative ideas (Beghetto, 2006), but the process is larger than being a cheerleader. It also requires helping students understand that creativity comes with both costs and benefits. As we have discussed elsewhere (Kaufman & Beghetto, 2013a), there is a time and a place for creativity.

Although proponents of creativity typically highlight the benefits of creativity (e.g. developing new products, procedures, and behaviors), there are personal and social risks involved in expressing one's creativity. It can waste time, be distracting or annoying to others, bring embarrassment or derision, or simply be ignored. Indeed, at extreme levels there can even be "malevolent creativity" (Cropley, Cropley, Kaufman, & Runco, 2010; Cropley, Kaufman, & Cropley, 2008). As such, teachers can help students develop the knowledge necessary to "read the situation" – determining whether creative expression is appropriate for a particular context.

Consider, for example, a student who writes a wildly lyrical poem on the beauty of mathematics instead of working through the proofs on an algebra exam. Although such a response would be considered quite original, it is not task-appropriate and therefore would not be considered creative in the context of the exam. In such a situation, the *Goldilocks principle* (Beghetto & Kaufman, 2007) can serve as a useful guideline for teachers – helping them keep in mind the importance of providing feedback that is not too harsh (stifling students' creative motivation to write poetry) or not harsh enough (paying too little attention to contextual expectations of the algebra exam). Just as Goldilocks sought oatmeal that was neither too warm nor too cold, the teacher in such a situation should provide feedback that is neither too soft nor too strict. The goal is to provide the right level – striking a balance to provide honest feedback that helps the student develop the knowledge necessary to

understand why a poem might not be considered creative in the context of an algebra exam, but might very well be creative in another context (e.g. a language arts class). Further, the teacher may work with the student to discover the many creative possibilities within algebra itself – algebraic proofs have multiple solutions, and a creative student can be challenged to find a path that no one else has found.

Accomplished creators have developed the expertise and experience necessary to know both when creativity is beneficial and when the costs may outweigh the benefits. This is a special type of self-knowledge called *creative metacognition* (CMC). CMC refers to “a combination of creative self-knowledge (knowing one’s own creative strengths and limitations, both within a domain and as a general trait) and contextual knowledge (knowing when, where, how, and why to be creative)” (Kaufman & Beghetto, 2013a, p. 160). Like other forms of metacognitive knowledge (Flavell, 1979; Pintrich, Wolters, & Baxter, 2000), CMC is a special form of cognition that helps people monitor and develop their creative competence. Metacognitive skills have long been viewed as playing a key role in learning and creativity and CMC refers to the awareness and ability necessary for developing one’s creative ideas into creative contributions.

In the context of the classroom, teachers can help students take charge of their own creativity by helping them develop their CMC. They can help students learn which contexts and situations are more (or less) likely to be receptive to creative expression. Specifically, teachers can support CMC both when explaining task guidelines and when providing feedback to students – clarifying the constraints and expectations of particular assignments, tasks, and activities. Teachers can show students when and where original thinking and intellectual risk-taking is warranted on a particular assignment or task. Further, they can provide the rationale for expectations and constraints when creative expression may not be necessary or appropriate (e.g. “The reason why I am asking you to follow these guidelines, rather than come up with your own, is because I want you to first learn how to write a sonnet, then you can write your own poems based on this form of poetry”).

Creative saturation: a summary of strategies

How, exactly, might teachers work to establish a creativity-supportive learning environment? We want to thank an anonymous reviewer of an earlier draft of this article for raising this question. As the reviewer noted, unless we provide some concrete suggestions for practice, “too many teachers may throw up their arms in frustration and move on to other literature that offers more concrete, more manageable, more realistic messages and recommendations.” We agree and therefore want to highlight a few key suggestions that teachers can refer to when attempting to establish a creativity-supportive classroom. Incorporating these suggestions in one’s everyday classroom can help establish a learning environment permeated by an ethos of practices, interactions, and experiences that encourage, respect, and recognize creativity in oneself and one’s students (Cropley, 2006; Hong et al., 2009).

There are various practical insights that can be found in literature for how teachers might establish a creativity-supportive environment (e.g. Davies et al., 2012; Schacter et al., 2006). The creative teaching framework developed by Schacter and his colleagues (2006), for instance, is comprised of five creativity-supportive aspects of creative teaching that were derived from the creativity studies literature. Davies et al. (2006) also offer practical recommendations for establishing

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a creativity-supportive learning environment. In what follows, we provide a modified summary of those insights and add a few of our own.

- *Incorporate creativity in your everyday teaching.* This involves using activities that require students to generate and record multiple ideas and encourage students to redefine problems, use analogies, think in different ways, and evaluate the ideas and products they generate. This also involves helping students take charge of their own learning and creativity by explicitly teaching metacognitive strategies to help them decide when and how creative expression might be beneficial. For example, have students remove or replace a key scene or character in a story or historical event and describe how this would change the outcome, or ask students to use their creative writing to add a page to a novel being studied. Teachers can also support creative metacognition by explicitly discussing when it may (and may not) be beneficial to creatively modify existing stories and events.
- *Provide opportunities for choice, imagination, and exploration.* This involves incorporating student interest and some level of choice in learning activities. Learning activities should also require students to come up with their own ways to solve problems and, when appropriate, generate novel products, solutions, and outcomes. This also includes providing opportunities for students to work collaboratively and providing opportunities for them to understand how the use of their imaginative and mini-c thinking can lead to new ways of seeing things – moving from what currently *is* to what *could* or *should* be. An example of this is reported in Cho et al. (2013), a fifth-grade teacher after introducing the concept of the “economy” had her students work in small groups to come up with their own creative way of describing the economy. Each group provided a unique and meaningful response, including one group describing the economy as “a root,” explaining “Under the tree of economy, there are roots of product, consume, and distribution. There are also small roots like resources” (Cho et al., 2013, p. 164). Further examples of using different learning strategies and assignments can be found in Sternberg’s work (e.g. Sternberg, Grigorenko, & Zhang, 2008).
- *Monitor the motivational messages being sent by one’s classroom practices.* Even the most well-intended activities can inadvertently communicate creativity-dampening messages. Teachers should, therefore, monitor how students are experiencing these messages and strive to protect students’ intrinsic motivation by focusing students on the intrinsic aspects of the task (e.g. its value, why it is interesting) rather than extrinsic features (e.g. compete for the grade or to avoid “getting in trouble”). When using extrinsic motivators, explain and emphasize the value and importance of the task rather than trying to motivate students by inducing guilt or by using more controlling language (e.g. “If you don’t complete this you will [disappoint me, fail, miss recess, etc.]”).
- *Approach creativity and academic learning as means to other ends, rather than as ends in themselves.* Although creativity and learning can sometimes serve as an end in themselves, in the context of the classroom using creativity and academic learning as a means to some other end can result in the development of memorable, engaging, and realistic lessons – lessons that take on a life beyond the classroom. When students put their creativity and academic learning to work, through the use of meaningful school and community projects,

they not only have opportunities to deepen their creative and academic competence but can also make a difference in their schools and communities. Having students identify a need and work collaboratively with each other and outside experts to develop a creative solution for that need will help them creatively and meaningfully use what they have learned in the classroom. Examples range from school-based projects (e.g. testing the nutritional value of their school lunch and making recommendations to the school board) to larger community-based projects (e.g. designing and maintaining a school garden that can provide fresh produce to a local homeless shelter or producing an oral history of their town that can be installed as an exhibit in the local museum).

- *Model and support creativity in the classroom.* Creative leaders inspire creativity by demonstrating creativity themselves. This concept has been studied in detail in the business and industrial/organizational psychology research literature (e.g. Redmond, Mumford, & Teach, 1993), but it is equally true in the classroom. Teachers should view themselves and their teaching as a creative act. They will then be in a better position to model, encourage, and support their students' novel ideas, sensible risk-taking, curiosity, and meaningful self-expression. Just as students need support and encouragement for their creativity, so too do teachers. School administrators play a key role in establishing a school-wide environment supportive of creativity – providing enough structure and curricular flexibility for teachers to teach for and with creativity. Teachers can also find support by collaborating with other teachers and establishing partnerships with community organizations and experts who can help establish creative learning environments in and outside of the classroom. Creative classrooms have permeable physical structures that allow for creative learning to enter in and extend beyond the classroom walls.

Final thoughts

Both creativity and teaching can seem straightforward to outsiders. Yet whereas lay-people might also have an opinion on issues in medicine or law, they still recognize that a doctor or lawyer has specific expertise. If a doctor advises that your healthy snacks are full of saturated fat or a lawyer suggests that you cannot claim self-defense for speeding, their counsel is assumed to have a certain merit.

In contrast, both creativity and teaching can seem so intuitive that it can be hard to convince people that conventional wisdom can be wrong. The motorcycle activity is a perfect example; it seems to encourage a “fun” approach to mathematics and it seems that it should make students want to do math. Yet the opposite may be true, and students may inadvertently be groomed to dislike the activity.

Similarly, many truths of creativity are not obvious. Creative genius is certainly important (and a worthy goal), but there are many levels of creativity, from mini-c to Big-C. Something may be shockingly original and yet still not qualify as being “creative.”

Learning environments can both nurture and dampen creativity in students; indeed, the exact same learning environment may inspire one student and squelch another. Teachers can try to be aware of how the learning environment can be perceived by different students. Further, they can help students on their creative journeys – not only to be more creative, but to learn when their creativity will have

the most value. Nurturing creativity in a classroom context, therefore, requires that teachers develop a working understanding of the creativity studies literature and spend time monitoring how students are experiencing their classroom learning environment (see, e.g. essays in Beghetto & Kaufman, 2010). This includes encouraging students to share their creativity, providing supportive feedback to students when they do, and modeling creativity for students during the everyday act of teaching.

Notes

1. The July 2010 cover of Newsweek magazine, for example, had the disconcerting headline, “The Creativity Crisis” and included this subheading: “For the first time, research shows that American creativity is declining.” The Newsweek cover story (Bronson & Merryman, 2010) was based on an analysis of more than 250,000 scores of American children on the Torrance Test of Creative Thinking – demonstrating a steady decline in students’ scores starting in 1990 (see Kim, 2011). The most significant decline was found in early elementary grade students (kindergarten through third grade).
2. Brown may well end up Big-C, but at this time his work has not demonstrated the long-term legacy that is required (with apologies to Brown for the additional pressure).

References

- Amabile, T. M. (1979). Effects of external evaluation on artistic creativity. *Journal of Personality and Social Psychology*, 37, 221–233.
- Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Boulder, CO: Westview.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39, 1154–1184.
- Amabile, T. M., DeJong, W., & Lepper, M. R. (1976). Effects of externally imposed deadlines on subsequent intrinsic motivation. *Journal of Personality and Social Psychology*, 34, 92–98.
- Amabile, T. M., Goldfarb, P., & Brackfield, S. C. (1990). Social influences on creativity: Evaluation, coercion, and surveillance. *Creativity Research Journal*, 3, 6–21.
- Amabile, T. M., & Pillemer, J. (2012). Perspectives on the social psychology of creativity. *The Journal of Creative Behavior*, 46, 3–15.
- Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology*, 84, 261–271.
- Baer, J., & Garrett, T. (2010). Teaching for creativity in an era of content standards and accountability. In R. A. Beghetto & J. C. Kaufman (Eds.), *Nurturing creativity in the classroom* (pp. 6–23). New York, NY: Cambridge University Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Barron, F. (1955). The disposition toward originality. *The Journal of Abnormal and Social Psychology*, 51, 478–485.
- Barron, F. (1969). *Creative person and creative process*. New York, NY: Holt, Rinehart, & Winston.
- Beghetto, R. A. (2006). Creative self-efficacy: Correlates in middle and secondary students. *Creativity Research Journal*, 18, 447–457.
- Beghetto, R. A. (2009). Correlates of intellectual risk taking in elementary school science. *Journal of Research in Science Teaching*, 46, 210–223.
- Beghetto, R. A. (2013). *Killing ideas softly? The promise and perils of creativity in the classroom*. Charlotte, NC: Information Age.
- 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, 73–79.
- Beghetto, R. A., & Kaufman, J. C. (Eds.). (2010). *Nurturing creativity in the classroom*. New York, NY: Cambridge University Press.
- Beghetto, R. A., & Kaufman, J. C. (2013). Fundamentals of creativity. *Educational Leadership*, 70, 10–15.

- Berliner, D. C. (2011). Narrowing curriculum, assessments, and conceptions of what it means to be smart in the US schools: Creaticide by design. In D. Ambrose & R. J. Sternberg (Eds.), *How dogmatic beliefs harm creativity and higher-level thinking* (pp. 79–93). New York, NY: Routledge. 5
- Bronson, P. O., & Merryman, A. (2010, July 19). The creativity crisis. *Newsweek*, pp. 44–50.
- Clifford, M. M. (1991). Risk taking: Theoretical, empirical, and educational considerations. *Educational Psychologist*, 26, 263–297. 10
- Clifford, M. M., & Chou, F. (1991). Effects of payoff and task context on academic risk taking. *Journal of Educational Psychology*, 83, 499–507.
- Collins, M. A., & Amabile, T. M. (1999). Motivation and creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 297–312). New York, NY: Cambridge University Press. 15
- Craft, A. (2011). *Creativity and education futures: Learning in a digital age*. England: Trentham Books.
- 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.
- Cropley, D. H., Kaufman, J. C., & Cropley, A. J. (2008). Malevolent creativity: A functional model of creativity in terrorism and crime. *Creativity Research Journal*, 20, 105–115. 20
- Csikszentmihalyi, M. (1999). Implications of a systems perspective for the study of creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 313–335). New York, NY: Cambridge University Press.
- Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2012). Creative learning environments in education: A systematic literature review. *Thinking Skills and Creativity*, 8, 80–91. 25
- Dewey, J. (1897). My pedagogic creed. *School Journal*, 54, 77–80.
- Eisenberger, R., & Cameron, J. (1998). Reward, intrinsic interest, and creativity: New findings. *American Psychologist*, 53, 676–679. 30
- Eisenberger, R., & Shanock, L. (2003). Rewards, intrinsic motivation, and creativity: A case study of conceptual and methodological isolation. *Creativity Research Journal*, 15, 121–130.
- Ericsson, K. A. (Ed.). (1996). *The road to expert performance: Empirical evidence from the arts and sciences, sports, and games*. Mahwah, NJ: Erlbaum. 35
- Feist, G. J. (2010). The function of personality in creativity: The nature and nurture of the creative personality. In J. C. Kaufman & R. J. Sternberg (Eds.), *The Cambridge handbook of creativity* (pp. 113–130). New York, NY: Cambridge University Press.
- Flavell, J. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34, 906–911. 40
- Galton, F. (1869). *Hereditary genius: An inquiry into its laws and consequences*. New York, NY: Macmillan.
- Glăveanu, V. (2013). Rewriting the language of creativity: The Five A's framework. *Review of General Psychology*, 17, 69–81.
- Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444–454. 45
- Hennessey, B. A. (2010a). Intrinsic motivation and creativity in the classroom: Have we come full circle? In R. A. Beghetto & J. C. Kaufman (Eds.), *Nurturing creativity in the classroom* (pp. 329–361). New York, NY: Cambridge University Press.
- Hennessey, B. A. (2010b). The creativity-motivation connection. In J. C. Kaufman & R. J. Sternberg (Eds.), *The Cambridge handbook of creativity*. New York, NY: Cambridge University Press. 50
- Hennessey, B. A., & Amabile, T. M. (2010). Creativity. *Annual Review of Psychology*, 61, 569–598.
- Hong, E., Hartzell S. A., Greene M. T. (2009). Fostering creativity in the classroom: Effects of teachers' epistemological beliefs, motivation, and goal orientation. 55
- Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for creativity: A quantitative review. *Creativity Research Journal*, 19, 69–90.
- Ingersoll, R. M. (2003). *Who controls teachers' work? Power and accountability in America's schools*. Cambridge, MA: Harvard University Press.
- Jauk, E., Benedek, M., Dunst, B., & Neubauer, A. C. (2013). The relationship between intelligence and creativity: New support for the threshold hypothesis by means of empirical breakpoint detection. *Intelligence*, 41, 212–221. 60

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- AQ23 Johnson, L. G., & Hatch, J. A. (1990). A descriptive study of the creative and social behavior of four highly original young children. *The Journal of Creative Behavior*, 24, 205–224.
- 5 Kangas, M. (2010). Creative and playful learning: Learning through game co-creation and games in a playful learning environment. *Thinking Skills and Creativity*, 5, 1–15.
- Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The four C model of creativity. *Review of General Psychology*, 13, 1–12.
- 10 Kaufman, J. C., & Beghetto, R. A. (2013a). In praise of Clark Kent: Creative metacognition and the importance of teaching kids when (not) to be creative. *Roeper Review*, 35, 155–165.
- Kaufman, J. C., & Beghetto, R. A. (2013b). Do people recognize the Four Cs? Examining layperson conceptions of creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 7, 229–236.
- 15 Kaufman, S. B., & Kaufman, J. C. (2007). Ten years to expertise, many more to greatness: An investigation of modern writers. *The Journal of Creative Behavior*, 41, 114–124.
- AQ24 Kim, K. H. (2005). Can only intelligent people be creative? *Journal of Secondary Gifted Education*, 16, 57–66.
- 20 Kim, K. H. (2011). The creativity crisis: The decrease in creative thinking scores on the torrance tests of creative thinking. *Creativity Research Journal*, 23, 285–295.
- Lofing, N. (2009, January 10). Davis sixth-grader's science experiment breaks new ground. *Sacramento Bee*. Sacramento, CA. Retrieved from <http://www.sacbee.com/education/v-print/story/1530953.html>
- 25 Maehr, M. L., & Midgley, C. (1996). *Transforming school culture*. Boulder, CO: Westview Press.
- Midgley, C. (Ed.). (2002). *Goals, goal structures, and patterns of adaptive learning*. Mahwah, NJ: Erlbaum.
- Nickerson, R. S. (1999). Enhancing creativity. In R. J. Sternberg (Ed.), *Handbook of human creativity* (pp. 392–430). New York, NY: Cambridge University Press.
- 30 Niu, W. (2007). Individual and environmental influences on Chinese student creativity. *The Journal of Creative Behavior*, 41, 151–175.
- AQ25 Partnership for 21st Century Schools [P21]. (2011). *Framework for 21st century learning*. Retrieved December 20, 2013, from <http://www.p21.org/overview/skills-framework>
- 35 Pintrich, P. R., Wolters, C., & Baxter, G. (2000). Assessing metacognition and self-regulated learning. In G. Schraw & J. Impara (Eds.), *Issues in the measurement of metacognition* (pp. 43–97). Lincoln, NE: Buros Institute of Mental Measurements.
- Plucker, J., Beghetto, R. A., & Dow, G. (2004). Why isn't creativity more important to educational psychologists? Potentials, pitfalls, and future directions in creativity research. *Educational Psychologist*, 39, 83–96.
- 40 Redmond, M. R., Mumford, M. D., & Teach, R. (1993). Putting creativity to work: Effects of leader behavior on subordinate creativity. *Organizational behavior and human decision processes*, 55, 120–151.
- Renzulli, J. S. (2002). Emerging conceptions of giftedness: Building a bridge to the new century. *Exceptionality*, 10, 67–75.
- 45 Rhodes, M. (1961). An analysis of creativity. *Phi Delta Kappan*, 42, 305–310.
- Robinson, K. (2006, February). *How schools kill creativity* [Video]. Retrieved December 12, 2013, from http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity.html
- Runco, M. A. (2003a). Education for creative potential. *Scandinavian Journal of Educational Research*, 47, 317–324.
- AQ26 Runco, M. A. (2003b). Creativity, cognition, and their educational implications. In J. C. Houtz (Ed.), *The educational psychology of creativity* (pp. 25–56). Cresskill, NJ: Hampton Press.
- 50 Runco, M. A. (2007). *Creativity. Theories and themes: Research, development, and practice*. Burlington, MA: Elsevier Academic Press.
- 55 Schacter, J., Thum, Y. M., & Zifkin, D. (2006). How much does creative teaching enhance elementary school students' achievement? *The Journal of Creative Behavior*, 40, 47–72.
- AQ27 Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal*, 16, 361–388.

- Simonton, D. K. (1990). History, chemistry, psychology, and genius: An intellectual autobiography of historiometry. In M. A. Runco & R. S. Albert (Eds.), *Theories of creativity* (pp. 92–115). Newbury Park, CA: Sage. 5
- Simonton, D. K. (2012). Taking the US patent office criteria seriously: A quantitative three-criterion creativity definition and its implications. *Creativity Research Journal*, 24, 97–106.
- Stein, M. I. (1953). Creativity and culture. *The Journal of Psychology*, 36, 311–322.
- Sternberg, R. J., Grigorenko, E. L., & Singer, J. L. (Eds.). (2004). *Creativity: From potential to realization*. Washington, DC: American Psychological Association. 10
- Sternberg, R. J., Grigorenko, E. L., & Zhang, L. F. (2008). Styles of learning and thinking matter in instruction and assessment. *Perspectives on Psychological Science*, 3, 486–506.
- Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York, NY: Free Press. 15
- Tighe, E., Picariello, M. L., & Amabile, T. M. (2003). Environmental influences on motivation and creativity in the classroom. In J. C. Houtz (Ed.), *The educational psychology of creativity* (pp. 199–222). Cresskill, NJ: Hampton Press.
- Torrance, E. P. (1970). *Encouraging creativity in the classroom*. Dubuque, IA: William C. Brown Company. 20
- Torrance, E. P. & Gupta, R. K. (1964). *Programmed experiences in creative thinking. Final report on Title VII Project to the US office of education*. Minneapolis, MN: University of Minnesota.
- Vygotsky, L. S. (1967/2004). Imagination and creativity in childhood. (M. E. Sharpe, Inc., Trans.). *Journal of Russian and East European Psychology*, 42, 7–97. 25
- Warnock, M. (1978). *Imagination*. Berkeley, CA: University of California Press.