Introduction

What is worth teaching? This is a timeworn and contested question. Dickens’ schoolmaster Gradgrind asserted that facts, and facts alone, are what should be taught. Educational reform initiatives that emphasize a “back to basics” approach to teaching seem to be a modern day enactment of Gradgrind’s curricular vision. Of course, just how far back to the basics schools should go is often hotly debated (Berlak & Berlak, 2012). In fact, educational policy makers, business leaders, and government officials from around the globe have increasingly questioned the value of focusing solely on the teaching of facts and have also called for teaching of creative thinking.

Why creative thinking? One reason is that creativity has been linked with economic and cultural prosperity (Florida, 2004). As such, teaching children how to think creatively is viewed as an investment in one’s students’ and country’s future. Beyond globalized market-based motives, which have raised concerns about potentially destructive ecological and cultural consequences (Craft, 2010; Craft, Gardner, & Claxton, 2008), there are other reasons why teaching creative thinking has received attention in recent years.

Creative thinking has been identified as a skill necessary for navigating the increasingly complex and ill-defined nature of life in the twenty-first century (Partnership for 21st Century Schools, 2011). Indeed, life in the twenty-first century is filled with uncertainty. Rapid technological, social, economic, and global changes contribute to this uncertainty. In an age of such rapid change, facts seem less fixed. What to teach and how to teach it is routinely called into question (Bonk, 2009). Life in the digital age has, according to some scholars, even altered the very nature of childhood. Craft (2011), for instance, has described how the proliferation of new technologies has provided children with unprecedented access to information—enabling them to take charge of their own learning both by selecting from ever expanding sources of digital information.
content and by authoring and contributing their own content. Although it is difficult to know, with any level of certainty, what the future will hold, teaching students to think creatively as they navigate life in the digital age is increasingly viewed as one of the best ways to prepare them to participate in designing their own futures (Craft, 2011; Wells & Claxton, 2002).

Yet another reason why teaching creative thinking has received increased attention in recent years is because concerns about the suppression of creativity in K12 schools and classrooms have been voiced in both popular media and the scholarly literature. The July 2010 cover of *Newsweek* magazine, for example, had the ominous headline, “The Creativity Crisis” and included this byline, “For the first time, research shows that American creativity is declining” (Bronson & Merryman, 2010). The *Newsweek* story was based on an analysis conducted by Kim (2011) who examined more than 250,000 scores of American children and adults on the Torrance Test of Creative Thinking and found that there was a steady decline in students’ scores starting in 1990. Ken Robinson’s (2006) TED talk, “How schools kill creativity” is another example. Robinson’s talk has gone viral and, of this writing, has nearly 20 million views. Berliner’s (2011) neologism, *creaticide*, is yet another example. Berliner defined creaticide as “the national design to kill literary, scientific, and mathematical creativity in the school-age population of the United States of America, particularly among impoverished youth” (p. 79). Berliner has asserted that creaticide is the consequence of educational policies that have profoundly narrowed the curriculum, the assessments used to measure learning of that curriculum, and “a narrowing of the schools’ conceptions of what it means to be smart in school” (p. 79).

Taken together these reasons have served as a potent stimulus for gaining the attention of educators, policy makers, and business leaders. But recognizing the value of teaching creative thinking is one thing, understanding how to go about doing so is quite another (Beghetto & Kaufman, 2013). The aim of this chapter is to provide an overview of current theory and research on the teaching of creative thinking in K12 settings. Specifically, the chapter will open by providing an historical context of teaching for creativity—discussing the longstanding arguments in favor of teaching students to think creatively in schools and highlighting several key challenges that have impeded the attainment of this goal. This will be followed by a discussion of current directions in the research. The chapter closes by highlighting promising and needed directions for scholars interested in pursuing this line of research.

**Teaching for creativity: a historical context**

The twenty-first century goal of teaching students how to think creatively has, in part, stemmed from the recognized value of creativity and a concern that creativity has been systematically suppressed by narrow curricular mandates in schools and classrooms. Although the widespread recognition of this goal has increased in recent years, it is important to recognize that the goal of teaching students how to think creatively and concerns about obstacles that impede the attainment of this goal are not new. In what follows, I discuss historical antecedents to this goal and the longstanding challenges surrounding this goal. Understanding these historical antecedents can help researchers go beyond the surface and identify the deeper challenges and opportunities that inhere in teaching for creativity.

**Creative thinking as a core educational goal**

The present day goal of teaching for creativity has emerged, in part, from a broader, venerable goal of education: preparing students for the future. As I have discussed elsewhere (Beghetto,
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In 2013, this goal presents educators with a seemingly unsolvable paradox: if we can only know what we know now, how can we possibly know how to prepare children for an unknowable future? Indeed as Dewey (1897) noted, “it is impossible to foretell definitely just what civilization will be twenty years from now. Hence it is impossible to prepare the child for any precise set of conditions” (p. 77). The seemingly unsolvable paradox of attempting to educate students for the future, recognized by Dewey more than a century ago, seems even more intractable in the digital age given the increasingly complex, rapidly changing, and ill-defined nature of life in the twenty-first century.

Fortunately, Dewey not only highlighted the problem, he also offered a way out of this educating-for-the-future paradox. With Dewey we can say that educating for the future is less about identifying which set of fixed facts should be taught to children now, in hopes that their value will cash-out later in life, and more about cultivating children’s capacity to navigate the uncertainties of an unknowable future. Creativity is one such capacity.

Developing students’ creative capacity has long been viewed by scholars as a way to help students take charge of their learning, break from current habits, consider new possibilities, and, thereby, navigate uncertain futures (Greene, 1995; Guilford, 1950; Vygotsky, 1967/2004; Warnock, 1978). In the mid twentieth century, for instance, scholars representing various Western countries begin to make arguments in favor of establishing creative thinking as a central educational goal. Frank Barron (1969) noted that there was a “rapidly growing core of educators and educational programs throughout the United States dedicated to creativity as the most important goal of education” (p. 7). Mary Warnock, the British philosopher, similarly argued that cultivating children’s creative imagination is so important that it should serve as the “chief aim of education” (Warnock, 1978, p. 9). Lev Vygotsky, the legendary Russian psychologist, also argued that if a main objective of education is to prepare youngsters for the future, then the cultivation of the creative imagination should play a key role in the attainment of that goal (Vygotsky, 1967/2004). These timeworn assertions are echoed in the arguments put forth by contemporary creativity scholars and advocates.

Sawyer (2010), for instance, has recently explained that students must be able to go beyond the simple memorization of facts and, instead, take responsibility for their own learning and work creatively with what they know to “generate new ideas, new theories, new products, and new knowledge” (p. 176). In sum, teaching students how to think creatively represents a longstanding educational goal. This goal stems, in part, from a recognition that cultivating children’s capacity to think creatively will help prepare them to better navigate and define their own futures.

Creativity as compatible with learning

Creativity scholars have also historically recognized a link between creativity and learning. Jean Piaget (1973) recognized this link and titled one of his books, To Understand is to Invent. J. P. Guilford (1950) similarly argued that in order to have a comprehensive understanding of learning one must also take into account creative ideation and insight. Guilford also recognized that creative thinking does not occur in a vacuum, but rather in order to think creatively one must also draw on prior learning. Lev Vygotsky (1967/2004) recognized this reciprocal link between one’s creative imagination and one’s learning experiences, describing the link as a “double, mutual dependence” (p. 17). Specifically, the creative imagination is fueled by one’s prior experiences, and, at the same time, creative thinking enables one to learn more deeply by expanding beyond one’s prior experiences and current knowledge.

This historically recognized link between creativity and learning is also represented in more recent conceptualizations of creativity and learning. Donovan and Bransford (2005), for instance,
asserted that “new understandings are constructed on a foundation of existing understandings and experiences” (p. 4, italics added). The process of knowledge construction is also recognized in recent conceptions of creativity. Kaufman and Beghetto (2009) have similarly asserted that central to creative ideation “is the dynamic, interpretive process of constructing personal knowledge and understanding within a particular social cultural context” (p. 3, italics added). Similarly, recent “process theories” of creativity (Kozbelt, Beghetto, & Runco, 2010; Mumford, Blair, & Marcy, 2006; Ward, 2008) recognize that creative thought emerges from conceptual combinations, which have their basis in prior knowledge and experiences.

In sum, creativity has long been viewed as an important and academically compatible educational goal. That being said, researchers have also identified several longstanding challenges that have (and continue to) impede the teaching of creative thinking as part of the regular academic curriculum. Several of those challenges are highlighted in the sections that follow.

**Challenge 1: lack of clarity about creativity**

Creativity has historically been a mercurial construct. Although generally valued, creativity has often lacked a clear conceptual definition and has typically been confused with unconstrained originality, muddled with mystical overtones, and impeded by various misconceptions and stereotypes (Plucker, Beghetto, & Dow, 2004; Sternberg & Lubart, 1999). Consequently, this has made creativity a seemingly intractable topic of scholarly research and an equally challenging goal for inclusion in the mainstream curriculum of K12 schools and classrooms (Beghetto, 2010, 2013).

The lack of a clear understanding of creativity has also served as a key impediment for even the most ardent supporters of incorporating creative thinking in schools and classrooms. Barron (1969), reflecting on the lack of progress in educational creativity initiatives during the mid twentieth century, noted that well-intended but ill-informed creativity evangelists served as an “enemy within” (p. 2). This is because they were chasing after “instant creativity” (Barron, p. 3), which belies the sustained and sometimes difficult developmental trajectory necessary for creative accomplishment. It is therefore important that proponents of teaching children to think creatively have a clear understanding of creativity.

All of this is not to say that teaching creative thinking has not occurred in U.S. schools and classrooms. Creativity has, for several decades, been a key focus of the curricula of many gifted and talented programs and extracurricular educational programs. There are also examples of teaching with and for creativity in more traditional classrooms (Beghetto & Kaufman, 2010). Importantly, however, creativity is typically viewed as valued but separate from the mainstream academic curriculum (Beghetto & Kaufman, 2009). This separation happens when creative and academic thought are conceptualized as conflicting epistemologies. More specifically, creative and academic thought are perceived as incompatible when one believes that the nature of creative thought is represented only by one’s ability to generate novel ideas and the nature of academic thought is represented primarily by one’s ability to acquire and accurately reproduce preexisting ideas.

The belief that creative thought is simply the ability to generate novel ideas has its basis in longstanding misconceptions about creativity (Plucker et al. 2004; Runco, 2004). Indeed, scholars generally agree that creativity requires the combination of originality and task appropriateness. In other words, creative thinking is represented by the combination of divergent and convergent thought. Unfortunately, when it comes to creativity in the classroom, there is a persistent “originality bias” (Beghetto, 2010; Runco, 2004)—equating creativity with unconstrained originality. This originality bias is one reason why creativity and academic learning are often viewed as competing (rather than compatible) curricular goals.
Similarly, viewing academic learning as primarily the ability to assimilate and accurately reproduce preexisting ideas has its basis in inherited beliefs about the “educated mind” (Beghetto, 2013). These beliefs have been traced back to the development of mass schooling efforts that aimed to prepare students for industrialized life in the early twentieth century (Sawyer, 2010). Teaching students how to “memorize and master the same core curriculum” had the goal of easing the “transition from school student to factor worker” (Sawyer, p. 176). Given this view, it is easy to see how the narrow goal of teaching students to acquire and reproduce “ready-made knowledge” (Hatano, 1993) would be viewed as incompatible with the goal of teaching students to generate novel thoughts and ideas.

Although there have been creativity researchers who have recognized a tight conceptual connection between creative and academic thought (Beghetto & Kaufman, 2007; Guilford, 1950), this connection quickly dissolves when creativity is equated with unconstrained originality and academic learning is equated with the acquisition and accurate reproduction of preexisting knowledge. When this happens, teachers feel they must choose between teaching either academic thinking or creative thinking. Given that cultivating children’s creative thinking has long been viewed as more of a curricular luxury (Barron, 1969), and less of a serious endeavor as compared to academic learning (Eisner, 2002), it is understandable that teachers would feel compelled to choose the teaching of academic thought over creative thought. This choice is further reinforced by external accountability mandates that assess the students’ ability to engage in more convergent rather than divergent thinking.

Challenge 2: inertia in the educational system

Researchers, such as Barron (1969), have consistently noted that inertia in the educational system represents a persistent barrier when it comes to making the changes necessary to teach children how to think creatively. The educational system is indeed slow to change (Cuban, 1993). Sirotnik (1983) has, for instance, argued that although much has changed since the early 1900s, the core teaching and learning practices in American classrooms “appears to be the most consistent and persistent phenomena known in the social behavioral sciences” (pp. 16–17). More specifically, Sirotnik notes that although there have been changes in the social cultural context (ranging from world wars, economic upheavals, and technological innovations), classroom configurations (ranging from one-room school houses to large classroom complexes filled with 35 or more students) and educational philosophies (ranging from traditional/fixed, progressive/experimental, and back-to-the-basics views of the curriculum)—“the ‘modus operandi’ of the typical classroom is still didactics, practice, and little else” (p. 17). Sirotnik’s assertion that teaching and learning practices in American classrooms are slow to change has its basis, in part, from a massive, multiyear study of more than 1,000 elementary and secondary classrooms (Goodlad, Sirotnik, & Overman, 1979).

Goodlad (2004), a lead researcher on the study, explained that he and his research team observed that the majority of class-time was spent on teacher talk and the:

bulk of this teacher talk was instructing in the sense of telling. Barely 5% of this instructional time was designed to create students’ anticipation of needing to respond. Not even 1% required some kind of open response involving reasoning or perhaps an opinion from students.

(p. 229)

Goodlad went on to note that the findings were “so consistent in the schools in our sample that I have difficulty assuming that things are much different in schools elsewhere” (p. 229).
Convergent instructional practices are not limited to the United States. The results from a recent multiyear survey of over two thousand 11 to 16 year olds in the United Kingdom, for instance, serves as another example of the persistence of convergent teaching practices (Claxton, 2008). The survey asked students to report the three most common activities they engaged in during classroom instruction. The most common activities reported by students were “copying from the board or book,” followed by “listening to the teacher talking for a long time,” and “taking notes while my teacher talks” (Claxton, p. 22).

In sum, the inertia in classroom teaching and learning practices has long been identified by creativity researchers as a key source of resistance when it comes to incorporating creative thinking into the curriculum (Barron, 1969). Educational researchers who have conducted observational studies of classrooms describe, what Oakes and Lipton (2007) have called, a disturbingly familiar instructional scene: an individual teacher spending the majority of class-time transmitting factual bits of information to be copied and recited by rows of silently seated students. The age-old and seemingly resilient practice of teachers asking “known-answer questions” (Matusov, 2003) represents a longstanding impediment to the teaching of creative thinking.

Challenge 3: narrowly focused curricula

One of the most frequently noted obstacles to teaching creative thinking in K12 schools and classrooms is a narrowly focused curriculum (Berliner, 2011). Educational scholars and proponents of creativity have long warned about various creativity stifling effects resulting from too narrow a view of the curriculum. Narrow views of the curriculum are, as discussed above, an outgrowth of the inherited beliefs about the educated mind and slow to change.

John Dewey, once again, presaged many contemporary arguments about the dangers of adopting a narrow view of the curriculum. Specifically, Dewey (1897) observed that although we espouse a value for cultivating children’s imagination, we often undo much of our own talk by taking both too narrow a view of the curriculum and too narrow a view of the child’s imagination. Creativity scholars, in the mid twentieth century, have raised similar concerns. J. P. Guilford (1950), for example, noted that “under present-day mass-education methods, the development of the creative personality is seriously discouraged. The child is under pressure to conform for the sake of economy and for the sake of satisfying prescribed standards” (p. 448). E. P. Torrance (1959), similarly reported, “we have seen many indications in our testing of first and second grade children that many with apparently impoverished imaginations seemed to have been subjected to concerted efforts to eliminate fantasy from their thinking too early” (p. 313).

It is not surprising, then, that contemporary scholars and educators would continue to voice such concerns—particularly in light of recent external curricular mandates. Curricular mandates, such as the No Child Left Behind Act of 2001, have according to As Smith and Smith (2010) “sucked all of the air out of the ruminations of educators who might embrace creativity in the United States” (p. 252). Consequently, teachers can often feel like they are caught in the middle—pulled in one direction to prepare children for an uncertain future by developing their capacity to think creatively and pulled in the opposite direction to prepare students to perform well on present-day, fact-based assessments.

Trends in contemporary research

Examining student and teacher beliefs

Researchers have recognized that student and teacher beliefs about creativity play a non-trivial role in determining whether creative thought will be encouraged, expressed, and developed
in the classroom. With respect to teacher beliefs, creativity researchers have examined what teachers’ think about student creativity. This work has highlighted that although teachers often espouse a value for creativity, they sometimes view its behavioral manifestation in a more negative light—associating creative expression with disruptive, deviant, or otherwise undesirable classroom behaviors (Nickerson, 1999; Plucker et al., 2004; Runco, 2004; Scott, 1999; Westby & Dawson, 1995). Of course not all teachers associate creativity with negative behaviors. Those that do, however, likely are influenced by an incomplete understanding of the nature of creativity and how it might complement (rather than compete with) academic learning.

Researchers have also focused on the role that students’ self-beliefs play in developing students’ capacity to think creatively. Research on self-perceived competence in generating creative ideas (called “creative self-efficacy”), for instance, has highlighted links between such beliefs and a variety of positive learning outcomes, including: teachers’ ratings of subject matter learning (Beghetto & Baxter, 2012); students’ motivational beliefs and academic aspirations (Beghetto, 2006), and teachers’ ratings of students creative expression in elementary math and science (Beghetto, Kaufman, & Baxter, 2011). Importantly, self-beliefs are susceptible to bias and inaccuracy (Dunning, Heath, & Suls, 2004) and therefore should be viewed more as a potential creativity enhancer rather than a measure of creativity itself.

Examining motivational messages of the classroom

Researchers have also examined how students’ motivational experiences in the classroom might impact the development of their willingness to think creatively. The program of research conducted by Teresa Amabile and her colleagues (see Amabile, 1996; Hennessey, 2010; Hennessey & Amabile, 2010), for example, has provided important insights into how features of the classroom environment might support (or thwart) creative thinking. Specifically, Amabile and her colleagues have demonstrated that students’ willingness to think creatively is typically impeded by classroom environments that stress extrinsic motivators (such as competition and social comparison, heightened anticipation of evaluative judgments, and the promise of rewards and other incentives for creative work). Conversely, students are more likely to think creatively in environments that support their intrinsic motivation (such as tasks that students’ find interesting, enjoyable, engaging, and optimally challenging).

Extrinsic motivators do not always have a negative impact on students’ motivation to think and act creatively (see Eisenberger & Cameron, 1998; Eisenberger & Shanock, 2003). However, the findings by Amable and her colleagues are sufficiently compelling to suggest that extrinsically motivating learning environments tend to have a more negative impact than do learning environments that students find interesting, enjoyable, and sufficiently challenging.

Impact of instructional practices and formal training programs

Perhaps the most relevant line of research on teaching creative thinking has examined the kinds of instructional practices that more directly teach students’ how to think creatively. With respect to instructional practices, researchers have identified and summarized guidelines and content-specific suggestions for how teachers might take a more complimentary approach to teaching creative thinking in the context of academic subject matter learning (Beghetto & Kaufman, 2010).

Some researchers (e.g., Sternberg, 2010; Niu & Zhou, 2010) have focused on identifying instructional strategies and creative thinking habits that can help students develop their ability to think creatively in and across various academic subject areas and cultural contexts.
Other researchers have described how teachers might still teach students to think creatively in light of externally established content standards and accountability mandates (Baer & Garrett, 2010). Still others have focused on how teachers and researchers might simultaneously assess student’s subject matter learning and ability to think creatively in specific subject areas (Beghetto, 2013; Grigorenko, Jarvin, Tan, & Sternberg, 2008).

With respect to creativity training programs, the key question that most people want to have answered is: Are such programs effective? The simple answer is that it depends. Programs that focus on promoting “general creativity” or “instant creativity” have long been criticized for their lack of substance or basis in creativity research (Baron, 1969; Baer, 1998). Almost anyone can string together an engaging workshop filled with enjoyable divergent thinking activities, but it seems unlikely that such workshops will cultivate creativity.

Researchers who have examined whether and how training programs might enhance creative thinking and behavior have reported that there is evidence that certain types of training programs can foster creativity (Nickerson, 1999; Scott et al., 2004). Programs that yield the greatest creativity performance gains are those that tend to use realistic and domain specific activities when attempting to develop participants’ creative thinking skills and strategies (Scott et al., 2004). More specifically, the most promising programs are those that are domain specific, lengthy, challenging, have a sound basis in the cognitive activities that underlie creativity, include illustrations of how principles and strategies are applied in real-world cases, and provide ample opportunities to apply those strategies in realistic contexts (Scott et al., 2004). Creative Problem Solving (CPS) programs, serve as an example (see Isaksen & Treffinger, 2004). Such programs focus on teaching a blend of thinking skills aimed at generating ideas (e.g., problem finding, using analogies and metaphors) and evaluating ideas (e.g., idea evaluation, solution monitoring, convergent and critical thinking) in realistic and domain specific contexts.

Conclusion and future directions

Research on teaching creative thinking represents a vibrant and challenging line of inquiry. Researchers have long recognized the importance of teaching students to think creatively and the challenges that inhere in attempting to do so. In recent years, educational policy makers, government officials, and business leaders have increasingly recognized the importance of teaching creative thinking in K12 schools and classrooms.

Although there are some thorny and timeworn challenges that face researchers interested in this line of work, there are also fairly consistent and promising insights that can be gleaned from the extant findings of scholars who have been working in this area over the past fifty plus years. Researchers interested in this line of work therefore have an opportunity to build on existing findings, work towards addressing longstanding challenges, and carve out their own unique contributions in this key area of research on thinking. In what follows, I highlight a few of the most promising and needed future directions in the research on teaching creative thinking in schools and classrooms.

Future directions

Developing Conceptual Clarity. Over the years, researchers have produced a great deal of work that has identified a problematic lack of conceptual clarity about creativity. Indeed, if creativity is conceptualized in such a way that it is viewed as incompatible with learning, then there is little hope that insights about how to improve creative thinking will find their way into the everyday curriculum. Although the problem of conceptual clarity is well known in the field
of creativity studies, little is known about how to best clarify teachers’, students’, and other creativity advocates’ conceptions of creativity. Consequently, there is much additional work that is needed in this area—particularly given the resurgence in the popularity of naming creativity as a core K12 curricular goal.

**Team-based, Multi-method Approaches.** Although creativity researchers have long based their programs of research in actual classrooms (e.g., Torrance, 1959), additional research is needed that takes a more team-based and multi-method approach to understanding the development of creative thinking in-situ. In order to do so, researchers would be well served to work in teams—working alongside teachers and using mixed-methods research designs to examine and understand the opportunities, obstacles, and outcomes (both intended and unintended) of attempting to incorporate the teaching of creative thinking in the curriculum. Such work represents a massive undertaking, but seems necessary as the efforts of individual researchers is unlikely to yield the insights necessary to understand for whom, in what context, and at what costs teaching students to think creatively yields desirable educational outcomes.

**Global, Integrative Efforts.** The somewhat independent efforts of researchers of the past have helped to shed light on challenges and opportunities for teaching creative thinking. Such efforts, however, fall short when it comes to establishing creative thinking as a component of the mainstream curriculum. This is because the phenomenon of creativity, and the context of K12 classrooms, represent two particularly unwieldy and complex areas of inquiry. What is needed, and has increasingly been called for by creativity scholars, is a more global and interdisciplinary approach to studying creativity (Hennessey & Amabile, 2010; Reiter-Palmon, Beghetto, & Kaufman, in press; Kaufman & Sternberg, 2006; Sawyer, 2012; Tan, 2007).

In sum, integrative efforts that synthesize and communicate research findings across disciplines and cultures are needed to help ensure that important existing and divergent findings are not overlooked or efforts duplicated. Researchers would do well to take stock of the findings and insights already at hand, work collaboratively with fellow travelers exploring similar phenomena in other cultures and disciplines, and work towards synthesizing the insights that can directly inform policy and practice. Such international and multidisciplinary collaborations will help researchers and educators develop a deeper understanding of the socio-cultural and political opportunities and challenges that inhere in efforts aimed at teaching creative thinking in K12 schools and classrooms.

**References**


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