The Defragmentation of Creativity: Future Directions with an Emphasis on Educational Applications

Beth A. Hennessey and Malcolm W. Watson

Introduction

In 2010, Beth Hennessey and Teresa Amabile published a comprehensive review of the creativity research literature in the *Annual Review of Psychology*. In selecting which articles to review, rather than fall prey to their own potential biases, Hennessey and Amabile decided to rely on the consensus of experts. They started out by polling 21 eminent colleagues—all prolific researchers and theorists in the field of creativity research—asking that they nominate up to 10 articles or books, published since about 2000, that they considered to be "must have" references. Surprisingly, consensus was not to be had. In fact, this call for nominations did nothing more than add to their confusion. The poll yielded 110 suggestions of specific journal articles, book chapters, books, or entire volumes of a journal devoted to a particular topic. Of the 110 nominated references, only seven were suggested by two colleagues, and only one was suggested by three colleagues. Rather than make the reviewing process easier, this exercise only served to underscore the marked diversity of opinion and overall fragmentation of the creativity field.

Over the past few decades, there has been a virtual explosion in the creativity literature of topics, perspectives and methodologies. Yet careful scrutiny of the literature shows that few, if any, "big" questions are being pursued by a critical mass of investigators. In many respects, the scholarly understanding of the psychology of creativity has grown amazingly sophisticated, and contemporary researchers

B.A. Hennessey (✉)
Wellesley College, Wellesley, MA, USA
e-mail: bhennessey@wellesley.edu

M.W. Watson
Brandeis University, Waltham, MA, USA
e-mail: watson@brandeis.edu

G.E. Corazza and S. Agnoli (eds.), *Multidisciplinary Contributions to the Science of Creative Thinking*, Creativity in the Twenty First Century,
DOI 10.1007/978-981-287-618-8_2

now bring to the table an ever-expanding variety of analytic methodologies, disciplinary training and backgrounds. The problem, however, is that investigators in one subfield often seem entirely unaware of advances in another. Many creativity researchers (ourselves included) were trained as experimentalists—systematically manipulating one or two variables at a time and making every effort to keep all other factors constant and controlled. This is the tried and true scientific method after all. Yet some experimentalists have become so focused on the minute details of a specific creative situation or participant cohort that they fail to seek the bigger picture. As a result, research is often carried out at only one level of analysis (e.g., the individual or the group) and within only one discipline or subfield at a time. Of course, this problem of isolation of sub-domains of research is not unique to the creativity field. It tends to pervade many disciplines of inquiry (Ambrose 2005; Persson 2012, 2014).

In its final form, the message of Hennessey and Amabile's *Annual Review* was that researchers and theorists must now work to develop a systems view of creativity. "The 'whole' of the creative process must be seen as much more than a simple sum of its parts" (Hennessey and Amabile 2010, p. 571). Creativity must be operationalized as a result of a system of interrelated forces operating at multiple levels and requiring interdisciplinary investigation. This call for reform seemed to be sound, but it is easier said than done. Might there be some hazardous consequences involved when researchers attempt to develop a unified systems model of creativity?

Since the publication of the 2010 review, the call for a de-fragmentation of the field has, in fact, been referenced by a variety of investigators and theorists. Many appear to agree that an integration of the creativity literature is long overdue. For example, some of the important work that was shared at the 2013 conference at the Marconi Institute for Creativity in Bologna was directed toward that goal. We believe that it would indeed be a big step forward, a significant accomplishment, if we could actually construct what appear to be useful systems approaches or, dare we envision, one single, all-encompassing systems model. The construction of such an all-encompassing model would serve as an impetus for future research and would be of great use in synthesizing the literature and coordinating research efforts. In our view, it makes good sense to continue working in this direction.

After all, this is the course of action that is generally taken in any scientific domain. Preliminary research sets out to test one or more hypotheses. Soon, scientific models are constructed to depict or describe the phenomena in a way that makes them easier to understand, visualize and quantify. Over time, these initial models lead to the generation and systematic testing of new, more nuanced, hypotheses and models. Yet models run the hazard of sometimes oversimplifying reality because they cannot include all aspects. If they then end up complicating researchers' views of reality or taking them down wrong paths, they cease to be useful models.

Importantly, as the scientific inquiry of a phenomenon grows and becomes more and more multi-faceted, there sometimes comes a sort of tipping point, a juncture at which it is no longer possible to synthesize the scholarship, no longer

possible to extract commonalities across the many sub-areas of inquiry appearing in the literature. At such a point, creating a useful scientific model may not be possible because there would be too many phenomena left out or left unexplained. The empirical investigation of creativity seems to have reached this point.

Although we believe that researchers and theorists must now work to develop a systems framework of creativity that would support scientific model construction, the primary goal of this chapter is to voice our concern that this work does *not* end up leading to a sort of wholesale reduction of the field and to the creation of models that do not clarify our understanding of reality. In addition, we engage in the empirical study of creativity not ultimately for the sake of research but in order to better understand how to promote and "grow" creativity, and when we remind ourselves of that real-world focus, we come away questioning whether a so-called systems model or "grand theory" will do much to guide us in applied settings.

Integrative Models of Creativity

What would a truly integrative systems model consist of? How can we construct an integrated model that captures the highly complex system of interrelated forces operating at multiple levels to produce creative outcomes? Does it at all make sense to ask researchers and theorists to work to construct a systems model that simultaneously accounts for so-called "Big-C" (Einstein level creativity), "Pro-C" (the creativity of R&D developers working on the next "big thing"), "Little-C" and "Mini-C" (everyday level) creativity (see Kaufman and Beghetto 2009)? Perhaps this is not a realistic goal. Perhaps it is not even an important goal. Here are some related questions. Should both trait (personality and intelligence) and state (situation-specific) measures of creativity be included in our overarching model? Could one model adequately capture the creativity of children as well as the creativity of adults, both novices and experts in their fields? And would it make sense to incorporate into our model data collected worldwide, or would multiple models be necessary to account for demographic, ethnic and cultural distinctions? Moreover, if we are to subscribe to some recent research showing creative performance to be primarily domain-specific (as opposed to cutting across domains), should not even the most integrative model of creative behavior also focus on only one area of expertise at a time?

In 2011, John Baer published an especially thoughtful paper entitled *Why Grand Theories of Creativity Distort, Distract and Disappoint*. It is Baer's contention that we will never succeed in constructing an all-inclusive "grand", or systems, theory. Baer well understands the appeal of such an approach and reminds readers about how the study of particle physics was rejuvenated by just such an all-encompassing model. Yet he cautions that it is unlikely that any one theory or model will ever adequately describe, as he puts it, "the many very different kinds of cognitive [/behavioral] processes that underlie creativity in diverse domains" (p. 73). As Baer argued, trying to force such a theory is bound to impede both theory and practice and lead to more misunderstandings than worthwhile breakthroughs.

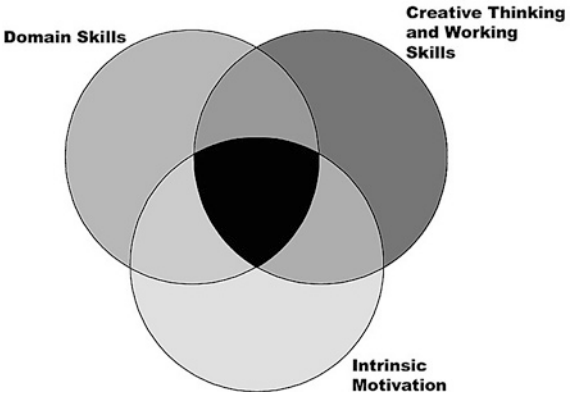

Fig. 1 The creative intersection (Reprinted with the permission of The National Research Center on the Gifted and Talented.)

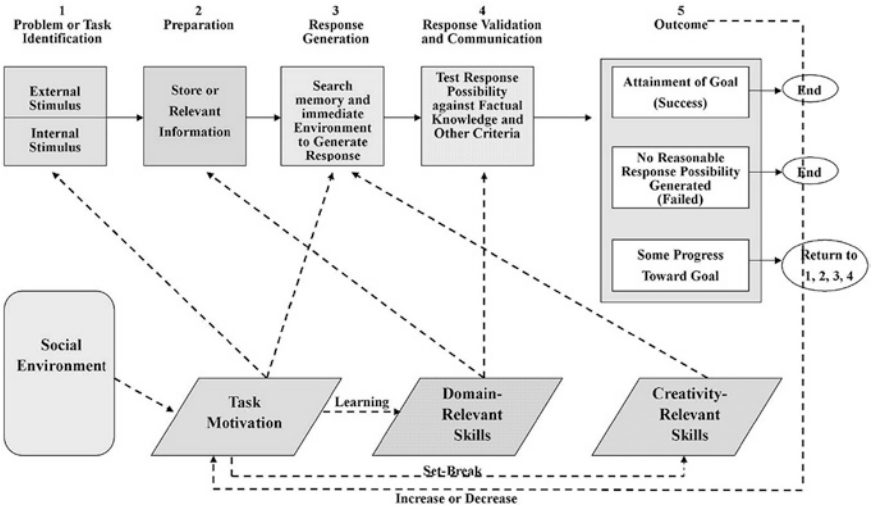

Fig. 2 Amabile's componential model (Reprinted with permission from: Amabile 1996, p. 113)

In an effort to make the problems inherent in model building more concrete, it might be helpful to consider some specific examples. For many years, a three-part rubric, the "creative intersection", first proposed by Amabile in the early 1980s (see Amabile 1996), guided much of Hennessey's own empirical work on creativity (see Hennessey 2004; Fig. 1).

This model was effective in simplifying the antecedents in the creative process and in providing a clear visualization, but the model functioned more as a metaphor than an accurate portrayal of causal pathways. Then, over time, Amabile and others began to build upon this conceptualization with the incorporation of additional constructs. In this next model offered by Amabile in the mid 1990s, cognitive components and feedback loops involved in the creative process were added (Fig. 2).

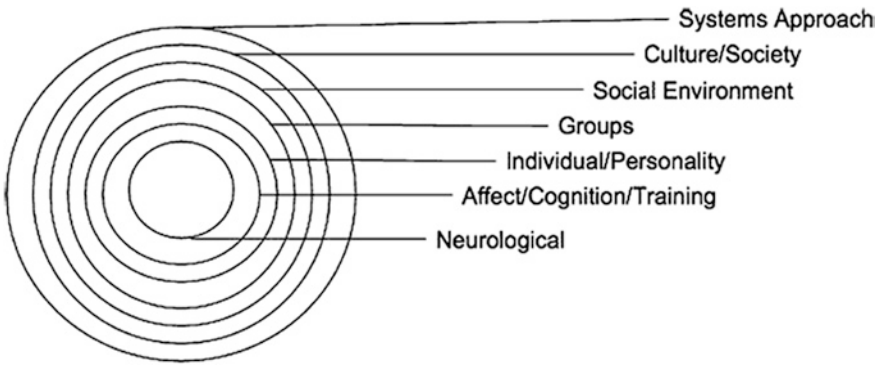

Fig. 3 Amabile and Hennessey annual review model (Reprinted with permission from: Hennessey and Amabile 2010, p. 571)

As would be expected, the complexity of models like this one is considerably greater than that of Amabile's original three-part rubric. Any theoretical framework or working model will likely increase in complexity as more is learned about the phenomena under study and as researchers' and theorists' understanding becomes increasingly nuanced.

But what about a consideration of individual differences and personality variables, cognitive developmental stages, the role of society and historical time and place, cultural and cross-cultural considerations, and the list goes on? In their *Annual Review* article, Hennessey and Amabile (2010) argued that researchers must realize that creativity arises through a system of interrelated forces operating at multiple levels and often requiring interdisciplinary investigation. They offered a simplified schematic of the major levels at which these forces operate. We say "simplified" because, of course, even the existing research does cross levels (Fig. 3).

Because any good theory or model will provide a better understanding of human behavior, it would serve as an impetus for future research and assist investigators in forming hypotheses to be tested. In fact, there are already a handful of systems models available that have done much to help creativity researchers and theorists organize their thinking and move forward in their research. For example, Csikszentmihalyi's (2006) framework suggests that a consideration of culture should be placed at the top of the hierarchy that explores how creative endeavor emerges within a social field.

And Glăveanu's (2010) work on creativity as cultural participation incorporates a three-way focus on creator, audience and existing artifacts (Fig. 4).

The Challenge of Applying Theory to Practice

Models such as those presented above have the potential to generate new research questions and directions, but will a systems view bring us closer to the successful application of research findings and theories in real-world contexts? What

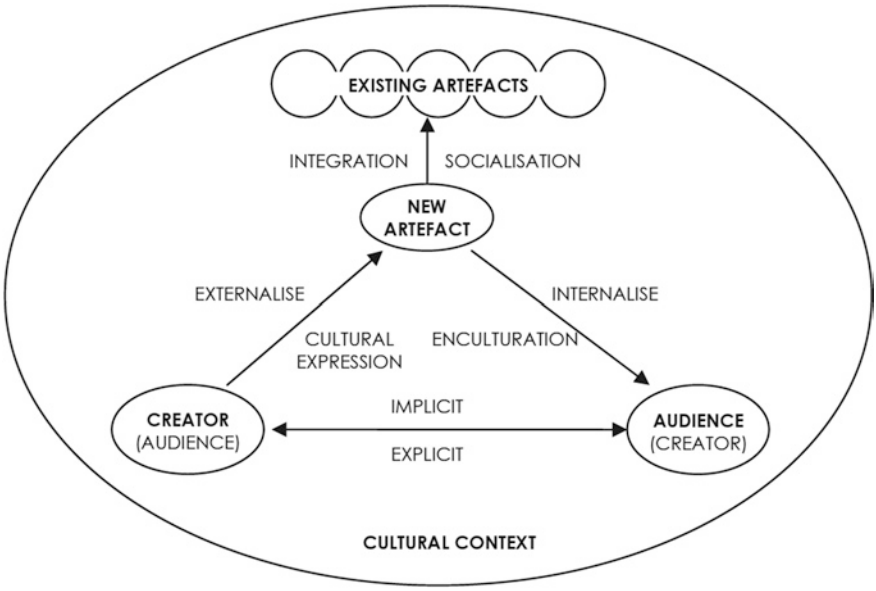

Fig. 4 Glăveanu's creativity as a socio-cultural-psychological process (Reprinted with permission from: Glăveanu 2010, p. 210)

real benefits will such systems models bring to the teachers of New York City or Bologna or Shanghai? Or what could they offer the so-called "managers for innovation" in Los Angeles, Rio or Warsaw? Will systems models make it any easier to promote the creativity of children in classrooms or help adults to make groundbreaking discoveries in the workplace? Will efforts to construct an all-encompassing systems model really make our own lives or the lives of others any better? Our own intuition is that attempts to apply multi-faceted systems perspectives to real-world problems and settings will only move us further away from the consideration of real people and their real needs. Because systems perspectives often complicate, rather than simplify, already highly complex situations, chances are good that practitioners—managers, teachers, trainers and product developers—will become paralyzed, unable to decide which pathways to explore, what to "fix" first. This distancing of theory and models from real-world applications will occur if our theorizing does not also remain mindful of the applied outcomes.

In our own work, we are both theoretical and applied. For example, we have theorized about how intrinsic and extrinsic motivation affect creativity, and we have used this theory to assess how motivation impacts actual creativity in classrooms in several different cultures. Others, of course, have focused on the promotion of creativity in the business world—in multi-national corporate settings or small entrepreneurial start-ups. Any consolidation of the scholarship on creativity must be driven in large part by the question of how best to serve real-world constituencies.

Those seeking to de-fragment the field have already encountered a number of inevitable forks in the road. Over time, they may conclude that it is impossible to construct a single systems model that applies across cultures and situations and serves equally well to inform school administrators and curriculum developers, scientists and engineers in the laboratory, and R&D team members and their managers in the workplace. They may discover that they need to construct multiple complementary models rather than a single, unified systems model of creativity. And perhaps that would be the direction to go.

We find it both somewhat surprising and at the same time hopeful that this same sentiment was recently expressed in an on-line blog appearing on the website of the *Harvard Business Review.* As part of this blog, Pallotta (2013) asks "What's the point of creativity?": "Increasingly, creativity—and the study of it—is divorced from the real needs of real people. Adding ever more gimmicks to a smartphone in the interest of increasing market share, rather than giving people something revolutionary that will make their lives better, reeks of something other than love and has no power to stir people's enthusiasm. So the question we have to ask ourselves in business is this: Why create? Are we doing it for the gratuitous sake of creativity itself, without any larger purpose? Are we doing it because *Harvard Business Review* writes about it all the time? Are we doing it out of fear? To make more money? To get on the cover of *Wired*? Or are we doing it out of a desire to improve people's lives and transform their sense of what possibilities life itself has to offer?" (retrieved from http://blogs.hbr.org/2013/09/does-your-innovation-come-from/).

What Pallotta is referring to here is a glaring disconnect between creativity theory, creative education/management training and actual creative problem solving. By definition, applied work must involve a step back from the level of abstraction adopted in a core theory. Only in this way can theory and the research findings it has generated throw light on specific creative challenges and situations.

Early explorations in the area of applied creativity were frequently directed at K-12 classrooms. Pioneers in this area included Torrance and deBono, as well as researchers and theorists associated with the Creative Education Foundation (CEF) in Buffalo, NY. In fact, Parnes, Osborn and others at the CEF actually used the term "applied creativity" to describe their work. Creativity mainstays such as brainstorming and Creative Problem Solving's (CPS) deliberate creativity techniques emerged from these efforts, and the CEF, now relocated to Scituate, Massachusetts, continues to make significant contributions to our understanding of real-world creativity and its promotion. But in the grand scheme of things, it must be observed that over the past few decades relatively little effort has been devoted to the application of research findings to classroom learning or other real-world settings where creativity might be helped to flourish.

One exception to this rule, of course, has been in the area of corporate creativity and innovation. Dozens of best-selling books and hundreds of empirical papers have been written with the intention of specifying what business leaders and their managerial forces can do to boost the creativity of their workers. Yet as Pallotta (2013) and others point out, the essential goal of these publications is to

help companies boost profits, which may or may not involve real problem solving. Moreover, an essential distinction must be made between the carrying out of research in real-world settings and the actual application of those research findings. At present, many creativity/innovation consultancies implement change models that lack strong empirical support or theoretical backing. Consultants are frequently hired on the basis of reputation or educational pedigree, and price is too often taken as an indicator of quality (von Nordenflycht 2010). In fact, consultants rarely return to assess whether their efforts have had a positive impact; and if they were to return, they would find that an assessment of their success (or lack thereof) was especially problematic. As Christensen et al. (2013) point out, it is exceedingly difficult to judge consultants' performance because a variety of external factors, including fidelity of execution, management practices, and the passing of time, greatly influence the outcome of the consultants' recommendations. Yet they argue that this situation is about to change. They identify what they term a "disruption" in the field of consulting for innovation. Christensen and colleagues also foresee on the horizon a similar disruption for education (Christensen et al. 2008).

American Schools: A Case in Point

We discuss the problems of fostering creativity in the American Education system as an example of the problems of tying theoretical research and scientific evidence to the solution of real-world problems. We suspect that the example of American education probably reflects similar cases and issues in other countries as well.

Across the past few decades, opportunities for the development and exercise of creativity in U.S. schools have been continually eroded. In this age of accountability and nationally mandated *No Child Left Behind (NCLB)/Common Core* regulations, the current U.S. educational climate is fraught with more killers of student (and teacher) intrinsic motivation and creativity than at any other time in the recent past. Teachers now face all sorts of possibilities for scrutiny as they "teach to the test" and worry that their salaries, and maybe even their ability to keep their jobs, may be dictated by their students' scores. Children attend pep rallies and chant slogans reminding them to "do their best" on upcoming high-stakes examinations. Entire schools branded by labels like "failing" or "underperforming" push on against incredible odds to boost student performance. Test scores mean everything, and thus there is no room for creativity in the classroom.

What are the signs of a disruption of this educational system in the U.S.? Slowly but surely, parents, teachers and even entire legislatures are rising up. Since 2011, at least 42 states and the District of Columbia have applied for and have been granted waivers allowing them to bypass one or more of the NCLB mandates. Most recently, the Iowa legislature voted to altogether opt out of the national educational standards, and many believe that this move will embolden other states to follow. Multiple reputable national polls also show that large segments of the population are deeply disturbed by what they see as an overemphasis on standardized

testing and a "one-size-fits-all" nationalized curriculum. In 2012, a Gallup poll revealed that the majority of U.S. citizens supported the idea that teachers should be evaluated on the basis of their students' test scores, but by 2013, another poll showed a marked reversal of opinion (Watanabe and Villeneuve 2013).

Coupled with this dissatisfaction with the educational status quo have been movements to infuse opportunities for creativity back into the classroom. Educational observers increasingly worry about the need to educate for the 21st century. Students, they argue, need to gain not only basic reading and writing skills and knowledge across the disciplines but also core competencies in critical thinking, creativity and innovation, problem solving, communication and collaboration. The global workforce needs to be schooled in both ways of thinking and ways of working (e.g., Saavedra and Opfer 2012). In response to this call for reform, a few states in the U.S have recently passed legislation mandating that schools provide frequent, high quality opportunities for students to engage in creative work. The details are still being worked out, but it appears that our own home state of Massachusetts, as well as Oklahoma, California and a few others, are moving toward the implementation of a so-called "creativity index" (Robelen 2012) designed to rate public schools on how well they "teach", "encourage" and "foster" creativity in students. One of the primary measures underlying this initiative is a tally of the number of opportunities each school provides for students to engage in creative activities. Our own concern here is that politicians and their educational advisors must be helped to understand that student *and teacher* creativity does not come easily. Given the pressures of NCLB/Common Core regulations and testing, it is already the rare teacher who can find the time, much less the motivation, to build opportunities for student creativity into the school day. The last thing teachers need is another punitive checklist against which their own performance and the performance of their students will be judged. And even if teachers were given the resources, the license and the time to organize science fairs, theatre productions and other open-ended activities, there is no guarantee that students' creativity would be increased. Creativity must not be trivialized by being reified by simplistic tallies of creative activities available.

Final Remarks on Theory and Practice

As argued previously, complex systems models are not likely to bring us closer to the successful application of research findings and theories in real-world contexts. Lawmakers, teachers, consultants and mangers need far more concrete and directed tools upon which to base their efforts to effect change. Creativity researchers and theorists wishing to contribute their expertise to educational or consultancy reform could learn a great deal from their colleagues in the area of "applied economics".

In the opinion of many economists, theory building and application must be treated as entirely separate enterprises. It appears that in this field there is an

accepted "theoretical core" that has been applied to a wide range of domains. But this theory, this core, was developed independently of individual applications; and within the economics profession, there are differing views as to exactly what belongs in the core (e.g., Backhouse and Biddle 2000).

As early as 1917, Keynes introduced a sharp conceptual distinction in the economics literature between political economy as a science (whereby laws governing the production and distribution of wealth are formulated) and political economy as an art (using those laws to solve practical problems). A similar view is also gaining momentum in the fields of architecture, engineering and business. Termed "Design Thinking", this movement advocates a sort of bifurcation of research and practice. Design Thinking is a methodology for generating practical, creative solutions to actual concrete problems. Rather than follow the scientific method, which would start with a precise definition of all the parameters of the problem, design thinkers begin with a focus on the goal that is to be achieved. Starting with the solution, design thinkers work to form an empathetic understanding of what it is that people really need or want and what they like or dislike about the current products, solutions or pathways available to them. Simply stated, Design Thinking matches real-world needs with what is practically feasible (see Brown 2008; Martin 2009).

We believe that these examples from economics and engineering may provide a useful roadmap. Nevertheless, the scientific method of empirical research and the quest to construct unified systems models are still important parts of the process. In a discussion of the differences between basic and applied research, Watson (1982) noted that we often talk as if one is theoretical and the other is not; we define basic and applied research in large part on a theoretical-atheoretical dimension. Atheoretical research comes about as researchers attempt to answer immediate, applied problems. That sounds efficient, but such research usually leads to a dead end because it supplies facts regarding a specific situation but no framework for making the facts generalizable to many situations. In truth, our systems models and unified theories are not really unifying if they cannot help to relate their theories to the goals and outcomes of teachers in the classroom or managers in the workplace, but, likewise, our applied research is not generalizable if it is not based on theory and model building. The difference between basic and applied research should not be thought of as whether the research is atheoretical or theoretical; it should all be theoretical. Rather, what makes both basic and applied research valuable is a focus on the applied problems in the real world as we develop our theories and models. Just like design thinkers who start with a solution, it is time for creativity researchers to set out to construct new, more situation-specific models—models that start with the needs of the constituencies in question. What do educators need to promote the creativity of their students? What do managers need to grow the creativity and innovation of their designers, their R&D scientists? Research directed at these questions should be used to build our theory and models in order to advance our understanding of the interrelated antecedents leading to creativity at the same time that researchers consider how their empirical findings can best be applied to real-life needs.

References

Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Boulder: Westview Press.

Ambrose, D. (2005). Interdisciplinary expansion of conceptual foundations: Insights from beyond our field. *Roeper Review, 27*, 137–143.

Backhouse, R.E., & Biddle, J. (2000). The concept of applied economics: A history of ambiguity and multiple meanings. *History of Political Economy,* 32, 1–24.

Baer, J. (2011). Why grand theories of creativity distort, distract and disappoint. *The International Journal of Creativity and Problem Solving, 21*(1), 73–100.

Brown, T. (2008). Design thinking. *Harvard Business Review, 86*(6), 84–92.

Christensen, C. M., Johnson, C. W., & Horn, M. B. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. New York: McGraw-Hill.

Christensen, C. M., Wang, D., & van Bever, D. (2013). Consulting on the cusp of disruption. *Harvard Business Review, 91*(6), 106–114.

Csikszentmihalyi, M. (2006). A systems perspective on creativity. In J. Henry (Ed.), *Creative management and development* (pp. 3–17). London: Sage.

Glăveanu, V. P. (2010). Creativity as cultural participation. *Journal for the Theory of Social Behaviour, 41*(1), 48–67.

Hennessey, B. A. (2004). *Developing creativity in gifted children: The central importance of motivation and classroom climate*. NRCG/T Senior Scholar Series. Storrs, CT: National Research Center on the Gifted and Talented (RM04202).

Hennessey, B. A., & Amabile, T. M. (2010). Creativity. *Annual Review of Psychology, 61*, 569–598.

Kaufman, J. C., & Beghetto, R. A. (2009). *Review of General Psychology, 13*(1), 1–12.

Keynes, J. N. (1917). *The scope and method of political economy*. London: Macmillan.

Martin, R. L. (2009). *The design of business: Why design thinking is the next competitive advantage*. Boston, MA: Harvard Business Review Press.

Pallotta, D. (2013). What's the point of creativity? Retrieved from http://blogs.hbr.org/2013/09/does-your-innovation-come-from/.

Persson, R. S. (2012). Cultural variation and dominance in a globalised knowledge-economy: Towards a culture-sensitive research paradigm in the science of giftedness. *Gifted and Talented International, 27*, 15–48.

Persson, R. S. (2014). The needs of the highly able and the needs of society: A multidisciplinary analysis of talent differentiation and its significance to gifted education and issues of societal inequality. *Roeper Review, 36*, 43–59.

Robelen, E. W. (2012). Coming to schools: Creativity indexes. *Education Week, 31*(1), 12–13.

Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st-century skills requires 21st-century teaching. *Phi Delta Kappan, 94*(2), 8–13.

Von Nordenflycht, A. (2010). What is a professional service firm. Toward a theory and taxonomy of knowledge-intensive firms. *Academy of Management Review, 35*, 155–174.

Watanabe, T., & Villeneuve, M. (2013, August 21). Public opposes use of test scores in teacher reviews, poll shows. *Los Angeles Times*. Retrieved from: http://articles.latimes.com/2013/aug/21/local/la-me-ln-education-poll-20130821.

Watson, M. W. (1982). Developmental psychologists in the classroom. In T. M. Amabile & M. L. Stubbs (Eds.), *Psychological research in the classroom: Issues for educators and researchers* (pp. 63–75). New York: Pergamon.