

**C**reativity is sometimes seen as irrelevant to educational practice. With an increased focus on standardized test scores, creative

teachers and those who encourage creativity in the classroom often are accused of being idealists or missing the big picture.

But we believe instead that creativity brings valuable benefits to the classroom. In this Resource Review, we provide answers drawn from the literature to the four questions most often asked about creativity.

Scholarly work on creativity first was stimulated in 1950 when J. Paul Guilford used his presidential address at the American Psychological Association (APA) to call for more research on the topic. Since then, research in this area has blossomed, and several recent books provide a solid overview of the field.

One of us (Sternberg) published the *Handbook of Creativity* in 1999 containing essays on the subject from a wide variety of scholars. In *Understanding Creativity* (2004), Jane A. Piirto creates a model of what she calls the seven I's of creativity—inspiration, imagery, imagination, intuition, insight, incubation and improvisation. R. Keith Sawyer's *Explaining Creativity* (2006) takes a socio-cultural focus, arguing that creativity can be understood only in the social and cultural contexts in which it occurs. Mark A. Runco's *Creativity: Theories*

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*James C. Kaufman is an associate professor of psychology and director of the Learning Research Institute at California State University, San Bernardino. Robert J. Sternberg is a professor of psychology and dean of the School of Arts and Sciences at Tufts University.*

## CREATIVITY

BY JAMES C. KAUFMAN AND ROBERT J. STERNBERG

*and Theme* (2006) is designed to be a textbook for the field.

### QUESTION ONE: WHAT IS IT?

Most definitions of *creative ideas* comprise three components. First, those ideas must represent something different, new, or innovative. Second, they need to be of high quality. Third, creative ideas must also be appropriate to the task at hand. Thus, a creative response to a problem is new, good, and relevant.

But the word can be applied not just to ideas: a person can be creative and so can a classroom or a piece of music. One way to organize research on creativity is by using the “four P’s” model, which distinguishes among the creative person, process, product, and press (i.e., environment). Studies of the creative person may look at the personality, motivation, or intelligence of a creator. For example, in Sternberg and Todd I. Lubart’s *Defying the Crowd* (1995), the writers propose the theory that creative thinkers are like good investors—they buy low and sell high, with ideas as the currency.

Other lines of research examine whether creativity is a generalized construct. In other words, is it more sensible to talk about the creative person in general or to talk about creative poets, mathematicians, and architects in particular? Essays that discuss this question can be found in *Creativity Across Domains* (2005), published by James C. Kaufman and John Baer, and in

*Creativity: From Potential to Realization* (2004), by Sternberg, Elena L. Grigorenko, and Jerome L. Singer. In their 2005 work, Kaufman and Baer use deciding to go to an amusement park as a metaphor for being creative. The model begins with initial requirements (conditions necessary for *any* type of creative act) and moves down to micro-domains (conditions necessary for writing short stories versus writing plays, for example). Just as one needs money, transportation, and the desire to go to an amusement park, so too does one need a (very) basic amount of intelligence, environmental support, and motivation to be creative.

One way of capturing the experience of being creative is through the concept of *flow*, which refers to the sensations and feelings that come when an individual is intensely engaged in an activity. Flow can be experienced in anything from rock climbing to playing the piano, as long as the individual’s abilities are a match for the challenges of the situation. Much of the work on flow was done by Mihalyi Csikszentmihalyi; his book *Creativity* (1996) is based on interviews with creative individuals about their experiences. Susan K. Perry’s *Writing in Flow* (1999) focuses on the flow experience in creative writing.

Another way of considering the creative process is found in the “geneplore” model originally proposed by Ronald A. Finke, Thomas B. Ward,

and Steven M. Smith and described in their book *Creative Cognition* (1996). The creative act, in their view, has two phases—generative and exploratory. During generation, the creator pictures a set of novel solutions to a problem. In the exploration phase, the creator evaluates the options and chooses the best one (or ones). There may be several cycles of creation and generation before a product is created.

Those products are themselves the focus of some creativity research. Sternberg, Kaufman, and Jean E. Pretz propose what they call the “propulsion model” of creativity in *The Creativity Conundrum* (2002), which outlines eight types of possible creative contributions.

The first four stay within the framework of an existing paradigm in a field; for example, in forward *incrementation* (such as a modification to an existing scientific theory), a product moves the field forward a bit. The final four types replace the current paradigm. In *reinitiation*, for example, the creator tries to move the field to a new starting point—as, for example, James Joyce in *Ulysses*.

Scholars have attempted to measure creativity in a number of ways. In her book *Creativity in Context* (1996), for example, Teresa M. Amabile discusses her consensual assessment technique, a method by which appropriate experts assign ratings to creative products (such as

a poem or a collage). These experts tend to agree on what is creative.

The most common measures of creativity are divergent-thinking tests—for instance, the Torrance Tests of Creative Thinking—which are based on the early works of pioneers in the field, such as J. Paul Guilford and E. Paul Torrance. *Creativity Assessment* (1999), a collection of readings edited by Gerard J. Puccio and Mary C. Murdock, includes republished original work by these giants. Measures of divergent production, usually in either verbal or figural format, elicit responses to questions with no single correct answer. Respondents might be asked about what different uses

## Resource Box I

### PUBLICATIONS

- Amabile, Teresa M. (1996). *Creativity in Context: Update to the Social Psychology of Creativity*. Boulder, CO: Westview.
- Baer, John, & Kaufman, James C. (2006). Creativity in English-speaking countries. In James C. Kaufman & Robert J. Sternberg (Eds.), *International Handbook of Creativity*. Cambridge: Cambridge University Press.
- Csikszentmihalyi, Mihalyi. (1996). *Creativity*. New York: Harper Collins.
- Dorfman, Leonid, Locher, Paul, & Martindale, Colin. (Eds.) (2006). *New Directions in Aesthetics, Creativity, and the Arts* (Foundations and Frontiers in Aesthetics). Amityville, NY: Baywood Press.
- Feinstein, Jonathan S. (2006). *The Nature of Creative Development*. Palo Alto, CA: Stanford University Press.
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- Perry, Susan K. (1999). *Writing in Flow*. Cincinnati, OH: Writer's Digest Books.
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- Sawyer, R. Keith, John-Steiner, Vera, Moran, Seana, Sternberg, Robert J., Feldman, David Henry, Csikszentmihalyi, Mihalyi, & Nakamura, Jeanne. (2003). *Creativity and Development*. Oxford: Oxford University Press.
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- Simonton, Dean Keith. (2004). *Creativity in Science: Chance, Logic, Genius, and Zeitgeist*. Cambridge: Cambridge University Press.
- Sternberg, Robert J. (Ed.) (1999). *Handbook of Creativity*. Cambridge: Cambridge University Press.
- Sternberg, Robert J. (2003). *WICS: Wisdom, Intelligence, and Creativity, Synthesized*. Cambridge: Cambridge University Press.
- Sternberg, Robert J., Kaufman, James C., & Grigorenko, Elena L. (Forthcoming). *Applied Intelligence*. Cambridge: Cambridge University Press.
- Sternberg, Robert J., Kaufman, James C., & Pretz, Jean E. (2002). *The Creativity Conundrum*. Philadelphia: Psychology Press.
- Sternberg, Robert J., & Lubart, Todd I. (1995). *Defying the Crowd*. New York: Free Press.
- Sternberg, Robert J., Grigorenko, Elena L., & Singer, Jerome L. (2004). *Creativity: From Potential to Realization*. Washington, DC: American Psychological Association.
- Sternberg, Robert J., & The Rainbow Project Collaborators (2006). The Rainbow Project: Enhancing the SAT through assessments of analytical, practical and creative skills. *Intelligence*, 34 (4), 321-350.
- Sternberg, Robert J., & Williams, Wendy M. (1996). “How to Develop Student Creativity.” Alexandria, VA: Association for Supervision and Curriculum Development.
- Weisberg, Robert W. (2006). *Creativity: Understanding Innovation in Problem Solving, Science, Invention, and the Arts*. New York: Wiley. ☞

one could make of a Q-Tip™ or be asked to finish an incomplete drawing. Those responses are scored for *fluency* (how many different responses were produced), *flexibility* (how many categories of responses were produced), *originality* (how novel and unique the responses were), and *elaboration* (how detailed and developed they were). These and other measurements of creativity are discussed on the Creativity Tests Web site at ([http://www.indiana.edu/%7Ebobweb/Handout/cretv\\_6.html](http://www.indiana.edu/%7Ebobweb/Handout/cretv_6.html)).

Finally, studies of the creative press (or environment) are designed to determine how a context enables people to be more creative. One theory that focuses on the relationship of a creator to the environment is Csikszentmihalyi's systems model (1996). He considers creativity to be a byproduct of the interactions among the domain (e.g., mathematics), the field (e.g., gatekeepers such as editors and critics), and the person. Other studies, though, stress the internal conditions of the creator. For example, Amabile (1996) considers the importance of *intrinsic motivation*, or being driven by a passion for the activity. Also important are domain-relevant skills (such as knowledge and specialized talent) and creativity-relevant skills (such as tolerance for ambiguity and appropriate risk-taking).

## QUESTION TWO: IS CREATIVITY JUST FOR GENIUSES?

Most investigations of creativity tend to go in one of two directions. The first is a focus on creativity in eminent people, or what is sometimes called "Big-C" creativity. Examples of "Big-C" creativity might be the novels of Toni Morrison or the scientific theories of Charles Darwin. The goals of this scholarly work are often to learn about creative genius and to discuss which creative works are likely to last and why. Dean Keith Simonton's work explores Big-C creativity through historiometric research (which involves studying eminent people's lives, among other things). His books *Greatness* (1994) and *Creativity in Science* (2004) are highly recommended.

The other approach looks at everyday, or "little-c," creativity. The focus of little-c researchers is typically on the thinking and work of ordinary people,

such as problem-solving, storytelling, or uttering witticisms. Robert W. Weisberg, in his 2006 *Creativity*, argues that the thinking processes used by the average person when being creative are the same as those used by geniuses. Even if the final product may not be remembered for generations, we are all capable of creative thought.

The book *Creativity and Development* (2003)—a roundtable discussion by Sawyer, Sternberg, Vera John-Steiner, Seana Moran, David Henry Feldman, Mihalyi Csikszentmihalyi, and Jeanne Nakamura—offers multiple perspectives on the development of little-c creativ-

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ity. Jonathan S. Feinstein's *Nature of Creative Development* (2006) uses case studies of creative individuals to analyze that development. Essays in Kaufman and Baer's *Creativity and Reason in Cognitive Development* (2006) discuss how creativity and reason can work together (or can be at odds) in cognitive development. This volume includes essays by noted scholars who focus on creativity in the schools, such as Ronald Beghetto and APA Division 10 president Jonathan Plucker. APA's Division 10 represents psychologists interested in creativity, aesthetics, and the arts, and it publishes a journal, *Psychology of*

*Aesthetics, Creativity, and the Arts*. (For more information on APA Division 10, see: <http://www.apa.org/divisions/div10/homepage.html>).

## QUESTION THREE: IS CREATIVITY AN OBJECT OF STUDY ONLY IN PSYCHOLOGY?

Much of the work discussed so far has been generated by psychologists, but the study of creativity has infiltrated other fields. It is often analyzed in the context of education, and especially the education of the gifted (see, for example, the Web sites of the National Association for Gifted Children's Creativity Division at <http://www.nagc.org/index.aspx?id=1419> and the Center for Creative Learning at <http://www.creative-learning.com/DearSchool.htm>).

Of course the fields of aesthetics and the arts often deal with the topic as well. Leonid Dorfman, Paul Locher, and Colin Martindale's *New Directions in Aesthetics, Creativity, and the Arts* (2006) is a collection of essays that offers evidence of scholarship across these areas, as does the Web site for the International Association of Empirical Aesthetics (<http://www.science-of-aesthetics.org/>).

Creativity has been studied in such diverse fields as economics, literature, and neuroscience. Creativity is also studied in the world of business and organizations. Puccio, Murdock, and Marie Mance, in their *Creative Leadership* (2006), are among the many who study creativity, innovation, and leadership. The master's degree in creativity offered at the International Center for Studies in Creativity at Buffalo State College (see <http://www.buffalostate.edu/centers/creativity/>) is focused on organizations.

## QUESTION FOUR: IS THE STUDY OF CREATIVITY JUST A WESTERN PHENOMENON?

Creativity is a burgeoning topic of interest across the globe. In addition to the research that has been discussed here, important work is being done in other countries, including India, Korea, Germany, and Spain. Kaufman and Sternberg's *International Handbook of Creativity* (2006) offers collected essays from international scholars in 15 different countries, including work by such well-known cross-cultural researchers as Todd Lubart, Elena Grigorenko, and



Weihua Niu. Much of the research and many of the theories discussed in that volume have never been published before in English.

Conceptions of creativity vary across cultures. Many Eastern cultures, for example, consider moral goodness and contributions to society as key requirements for creative work. In many cultures, creative work is anonymous and is believed to belong to the community.

## CREATIVITY: DESPITE PROBLEMS, A KEY TO EDUCATION

In a nation in which standardized tests are omnipresent, it may seem odd to seek recognition and reward for something as seemingly ineffable as creativity. But the models discussed here constitute multiple ways of conceptualizing, analyzing, and implementing creativity. Far from having too little information about it, we may be at the stage where the many approaches to the phenomenon can be daunting to someone not steeped in the literature.

We hope that this Resource Review has described and categorized the extensive research in a user-friendly manner. Further, we hope we have addressed a

common misconception about creativity, which is the assumption that it is reserved for a special few. In fact, it is relevant to the lives of us all. Although the genius of a Mozart or Shakespeare is indeed stirring, it is perhaps just as heartening to see the spark of creativity in a child writing his first poem or solving her first algebraic proof.

Although one cannot directly teach creativity, one can teach *for* creativity. This involves, first and foremost, encouraging students to be creative and rewarding creative behavior when it occurs. In the absence of encouragement and reward, creativity withers. For a fuller discussion of teaching for creativity, see Sternberg and Wendy M. Williams' (1996) "How to Develop Student Creativity."

Secondly, teaching for creativity requires the recognition that creativity is, in large part, an attitude toward life—a take on the topic that is explored in Roger Shrank's 1988 book, *The Creative Attitude*.

People are creative by virtue of their attitude toward the problems they face. First, creative people are willing to sell their creative ideas, understanding that there will be resistance to them. Second, creative people are willing to take sensible risks; they recognize that many creative ideas fail. Third, they realize that creativity is not something one does once but something to develop throughout a lifetime. Rather than living off the great idea they once had, people with a creative attitude toward life continue to move forward, constantly challenging themselves to do better and to see things in new ways.

It is possible to integrate creativity into large-scale assessments and admissions. With the support of Sternberg, dean of the School of Arts and Sciences, Tufts now invites applicants for admission to submit evidence of creativity, although it is not required. This development is part of a theory-based approach to assessment, utilizing Sternberg's 2003 *WICS: Wisdom, Intelligence, and Creativity, Synthesized* model, as well as his model of "successful" intelligence. (See Sternberg, Kaufman, & Grigorenko's *Applied Intelligence* [forthcoming], for a review of the theories and practice behind this program.) Such tests can both improve our predictions of college success and raise the overall caliber of the

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pool of applicants: SAT scores of applicants are up in the first year of the Tufts program (Sternberg and the Rainbow Project Collaborators, 2006).

An additional benefit of such assessments is the possibility of compensating for the ethnic differences that we see both in ability and achievement testing. Despite gender differences on most quantitative standardized tests (males score higher), creativity scores show no differences. And despite the traditional pattern on IQ and achievement tests that show European Americans and Asian Americans outperforming African Americans and Hispanic Americans, initial studies of creativity assessments have shown no differences across race and ethnicity. Testing for creativity, in other words, can improve student selection and assessment. For discussion of these findings, see Baer and Kaufman's 2006 essay, "Creativity in English-Speaking Countries."

There are many obstacles left to tackle—from definitional specificity and agreement to better methods of assessment—but the potential positive outcomes are worth the effort. We hope that with the advances made nationally and internationally and with the exciting developments such as the Tufts admission policy, the next decades will bring creativity to the forefront of research and practice. ☐

## Resource Box II

### WEB SITES

- American Psychological Association's Division 10 (Society for Psychology of Aesthetics, Creativity, and the Arts). <http://www.apa.org/divisions/div10/homepage.html>
- Creativity Tests: An Overview. [http://www.indiana.edu/%7Ebobbweb/Handout/crtv\\_6.html](http://www.indiana.edu/%7Ebobbweb/Handout/crtv_6.html)
- Center for Creative Learning. <http://www.creativelearning.com/DearSchool.htm>
- International Association for Empirical Aesthetics. <http://www.science-of-aesthetics.org/>
- International Center for Studies in Creativity. <http://www.buffalo-state.edu/centers/creativity/>
- National Association of Gifted Children: Creativity Division. <http://www.nagc.org/index.aspx?id=1419> ☞





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**Reconnecting Education & Foundations**  
Turning Good Intentions Into Educational Capital

**Ray Bacchetti and Thomas Ehrlich, Editors**

*Reconnecting Education & Foundations* exposes the too-often tattered relations between philanthropic foundations and educational institutions (both K-12 and higher education) with the goal of ensuring innovation and excellence in education. Provocative recommendations include a call for foundations and educational institutions to build and use "educational capital," the accumulation in usable form of validated experience and knowledge about successful educational ideas and strategies to improve teaching and learning.

"This impressive book by Bacchetti, Ehrlich, and their knowledgeable coauthors unveils through sound research and analysis the interlocking and often tension-ridden tripartite relationships among the institutions of private philanthropy (i.e., foundations), schools, and colleges."

—Donald M. Stewart, Visiting Professor

The Harris School of Public Policy Studies, The University of Chicago



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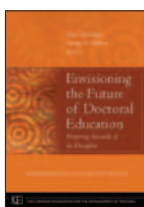
**The Advancement of Learning**  
Building the Teaching Commons

**Mary Taylor Huber and Pat Hutchings**

This important resource builds on the work of Carnegie's best-selling books, *Scholarship Reconsidered* and *Scholarship Assessed*, and explores the premise that the scholarship of teaching and learning holds the key to improving higher education.

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—Russ Edgerton, Former Director of Pew Forum on Undergraduate Teaching and President Emeritus, AAHE



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**Envisioning the Future of Doctoral Education**  
Preparing Stewards of the Discipline

**Chris M. Golde and George E. Walker, Editors**

The essays in this lively and provocative volume focus on six fields of study—chemistry, English, history, mathematics, education, and neuroscience—providing opportunities to compare and contrast doctoral education among the disciplines. The essays offer ideas

for fruitful practice, a perspective on doctoral education as a larger enterprise, and visions of the possible.

"Anyone who cares about the next generation of the professoriate must read this book! Its thesis—that Ph.D.s are 'stewards of their disciplines' as well as experts in their field—produces insightful essays with critiques of current doctoral education and suggestions for change."

—Katharine Lyall, President Emeritus, University of Wisconsin System



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**Educating Lawyers**

Preparation for the Profession of Law

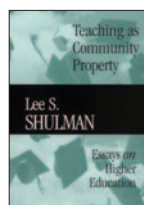
**William M. Sullivan, Anne Colby, Judith Welch Wegner, Lloyd Bond, and Lee S. Shulman**

Based on extensive field research at a wide variety of law schools in the United States and Canada, *Educating Lawyers* presents a richly detailed picture of how law schools work to transform students into professionals, probes the gaps and unintended consequences of key aspects of the law school experience, and offers recommendations for improving the professional education of lawyers.

"*Educating Lawyers* succeeds admirably... The call for the integration of the three apprenticeships seems to me exactly what is needed to make legal education more 'professional,' to prepare law students better for the practice of law, and to address societal expectations of lawyers."

—Stephen Wizner, Dean of Faculty

William O. Douglas Clinical Professor of Law, Yale Law School



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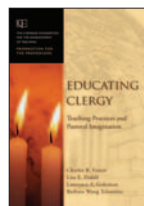
**Teaching as Community Property**  
Essays on Higher Education

**Lee S. Shulman**

For almost two decades, acclaimed education scholar Lee S. Shulman has been bringing uncommon wit and vision to issues of teaching and learning. *Teaching as Community Property* is a collection of Shulman's most influential papers and presentations, giving readers a unique window into his ideas and proposals for improving teaching and learning in higher education.

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—Alexander W. Astin, Director, Higher Education Research Institute, UCLA



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**Educating Clergy**

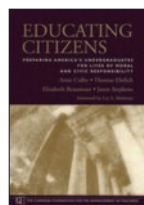
Teaching Practices and Pastoral Imagination

**Charles R. Foster, Lisa E. Dahill, Lawrence A. Golemon, and Barbara Wang Tolentino**

Drawing from extensive literary and field research of Roman Catholic, mainline and evangelical Protestant, and Reform and Conservative Jewish seminaries, the book examines the wide range of pedagogic resources that inform the efforts of clergy educators to maintain the relationship between theory and practice, intellect and commitment.

"At once visionary and practical, *Educating Clergy* will help seminary faculty, administrators, and boards do a better job of preparing religious leaders who can make a difference in the world."

—Arthur Holder, Dean and Vice President for Academic Affairs  
Graduate Theological Union, Berkeley, California



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**Educating Citizens**

Preparing America's Undergraduates for Lives of Moral and Civic Responsibility

**Anne Colby, Thomas Ehrlich, Elizabeth Beaumont, and Jason Stephens**

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