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Teaching Creatively and Teaching Creativity

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To my two co-editors, James and Heather, your expertise, humor, and insight infuse this book, and to my husband, Christopher, your continuing support and care makes life upbeat.

Smiles, MBJG

For my husband with much love, thank you for supporting me from the beginning in all my endeavors.

HTS

For Jeff and Lisa Smith, who brought me into Division 10 and PACA with open arms—thank you for your mentorship and your friendship.

With love, JCK

Foreword

The "Preface" to this volume cites an article in the July 10, 2010 issue of *Newsweek,* titled "The Creativity Crisis," by Po Bronson and Ashley Merryman. The subtitle of the article asserts, with typical journalistic extravagance, that research shows that American creativity is declining. What research actually shows is an apparent decline over the years in average scores on certain psychological tests that are accepted as conventional measures of creativity (mainly divergent thinking). The body of the article speculates that the "crisis" is occurring because children are spending too much time watching TV or playing video games and because schools do not foster creativity development in children. It finds no concerted effort to nurture creativity among students.

After having examined the contents of this volume, I think it is fair for me to say that none of the authors whose work appears in it would be inclined to agree with these dramatic assertions. They would probably be especially opposed to the claim that there is no concerted effort to nurture creativity in our educational system. A few of the authors of chapters in this volume admit that teachers may be anxious about including creative components in their teaching methods or curricula. Some teachers may feel that fostering creativity would interfere with teaching required curricula. Much as they might like to be creative, they fear that doing so could reduce their "effectiveness," as evaluated by their students' scores on so-called objective tests of learning, which are administered and scored by outsiders. Another source of anxiety may be concern on the part of some teachers that promoting creativity will foster students' resistance to discipline and hard work. Despite these possible reservations, all the writers who contributed to this volume seem to approach their task of describing creativity in the classroom with enthusiasm and confidence that stimulating creativity among students and creative teaching methods are more effective than older approaches that rely on memorization of facts and routinization of academic activities.

A glance at the contents of this book is enough to show clearly that it is mainly about practice, that is, about methods of teaching and techniques for stimulating creativity. Although many of the recommended techniques are evidence based, this book is not the place where a reader will find descriptions of complex research

designs: quasi-experimental studies of operationally defined variables, tables of quantitative outcomes, sophisticated statistical analyses, and conclusions about hypotheses drawn from competing theories. It is, however, the place to find descriptions of practical techniques that are known to be effective because the authors have used them and refined them, in some cases over a good many years. Therefore, is a place where a reader may pick up ideas that will stimulate his or her own curiosity and motivate him or her to become more creative in their own approaches to teaching and learning.

Being a book about contemporary practices this volume is also more about what can be done now than about what has been done or might have been done in the past, especially the distant past. Understandably, perhaps, none of the contributors says much about their early predecessors. After all, is not creativity itself usually defined in terms of newness, originality, uniqueness, independence of thought and action? Who would care much if someone came up with a new way of teaching the Pythagorean Theorem?

Today, perhaps no one would care, but, back in ancient Greece, Plato cared a lot, and what he wrote about it in the dialog referred to as Meno has served as a model for a certain kind of creative teaching (although he did not call it that) ever since. (Plato's Meno, translated by Benjamin Jowett, in 1999, is conveniently accessible on the Internet at http:www.gutenberg.org.)

In the Meno dialog, Socrates, Plato's spokesperson, makes the apparently ridiculous claim to Meno that there is no such thing as teaching. To prove his point he engages in systematic questioning of one of Meno's slaves, starting with simple questions about lines and squares and developing his interrogation step by step until eventually he draws from the boy an understanding of a special case of the Pythagorean Theorem: The relationship between the length of the diagonal of a square and the lengths of its sides. At one point in the dialog, Socrates says: "...observe, Meno that I am not teaching the boy anything, but only asking him questions."

Socrates was undertaking this task in order to prove a metaphysical idea that few would accept today, that is, that the human soul is immortal and that the boy is not being taught something new but recollecting something that he learned in an earlier life. However, the fact remains that, to the modern educator, the important point is that Socrates was demonstrating a creative method of teaching.

As one reads the chapters in this book, one finds it easy to see that creativity in modern teaching often resembles this Socratic approach. Many techniques recommended in the following chapters come down to a matter of asking the right questions (or making the right assignments) and letting students come up with their own answers. Almost everyone who works in the field of creativity today accepts the assumption that, although individual differences in level and type of ability are expected, all persons have at least some potential to be creative. Thus, most such educators would also expect be able to draw out at least some kind of creative responses from Meno's slave. To explain their assumed universality of creativity, modern scientists and educators are likely to point to similarities among

people in brain structure and function rather than to immortal souls and past lives, but the implications for teaching are pretty much the same.

Somewhat further along in Plato's dialog Socrates says, "Mark now the farther development. I shall only ask him, and not teach him, and he shall share the enquiry with me." Socrates' admonition shows clearly that he saw the enterprise not as an one-sided effort but as a joint project of questioner and responder. Obviously, Socrates was an early advocate of the modern idea that learning occurs best when the student is an active participant in the process.

Socrates anticipated modern educational thinking in at least one more way. At one point in the question and answer session, the boy says he does not know the answer to a question. Socrates then makes the observation that it is also an important accomplishment when one realizes that one does not know something, especially something that one previously thought he knew. This is an important assumption in the modern approach to experiential learning.

A significant contrast between Socrates' approach and some of those offered in this volume is that, despite his insistence that he was not giving the boy answers, Socrates was looking for definite replies, and he pursued his questioning systematically until he got them. So, even from the ancient Greeks we can perhaps learn that what has come to be called the "Socratic Method" probably works best when it involves convergent thinking. That is, it is most effective when there are specific, correct answers, and the teacher knows exactly what is wanted from the pupil. But it applies to some types of divergent thinking as well because even in those situations the questioner has at least some idea of what type of answer is wanted from the respondent. A response like "crack nuts with it" would be acceptable as a reply to a request for a novel use of a brick, but "boil it and eat it for dinner" would scarcely qualify.

What happens when a creative project is even more open ended? For instance, when a person is given a piece of paper and a pencil and told to draw something, anything at all? How much teaching is involved in that? In the extreme case, the answer may be "none," but the implications would not be the same as in the case of Socrates and the boy. On this point, another important, though too often neglected, person who had something to contribute to the discussion should be brought into the picture. A search of the manuscripts revealed that he is not mentioned by any of the contributors to this book. In fact, though, Sir Herbert Read (1893–1968), an English poet, critic of art and literature, and an anarchist had a good deal to say about it. Read advocated freedom to pursue creativity almost without bounds. He was highly critical of the education system of his day, and although he was English, his criticisms applied to the American educational system as well as to that of his native country.

Indeed, Read claimed that the educational system's rejection of creativity was so damaging that it made every child in it a potential neurotic and thereby endangered the mental health of society as a whole. He based his thinking on his own observations and on intensive studies of spontaneous art produced by young children. His investigations convinced him that children are naturally creative and that unfettered creativity throughout life is essential to mental health.

Though not a developer of curricula or a designer of specific teaching techniques, Read contributed ideas and proposals that distinguished his approach from conventional educational practices in many ways. He published a large number of works during his lifetime, but his seminal volume was *Education through Art*, published in 1943.

Along with others, Read succeeded in establishing the International Society for Education through Art (INSEA) as an executive arm of UNESCO in 1954. Since 2005, this organization has published a journal and has fostered research and collaboration among educators. For those who read this book and have not heard of the organization and would like to extend their learning by thinking creatively about the process and philosophy of education, it is probably well worth looking into.

Lawrence, KS, USA Franklin C. Shontz
August 17, 2012

Preface

Creativity sparks the flames of imagination and enjoyment for both teachers and their students. Authors have long argued that teachers should seek to enhance creativity in their students and take care to not stifle it (e.g., Torrance, 1977). In this era of standardized testing and No Child Left Behind, it is easy for creativity in the classroom to get lost. Teachers can have conscious or unconscious biases against creative students (Aljughaiman & Mowrer-Reynolds, 2005; Westby & Dawson, 1995) or a poor understanding of creativity itself (Schacter, Thum, & Zifkin, 2006; Seo, Lee, & Kim, 2005). How can we help those teachers who do value creativity? What tools can we provide them?

There are many ways teachers can encourage student creativity. One way to do so is for teachers to enhance their own creativity. Another way is for teachers to teach creatively, whether in the classroom, designing assignments, or via curriculum development. Still another is for teachers to teach with the goal of nurturing creativity in their students, whether by responding openly to creative questions and answers in the classroom, enhancing intrinsic motivation, or using various techniques demonstrated to enhance creativity in students (see Beghetto & Kaufman, 2010). As Dean Keith Simonton notes in his concluding chapter, teachers model creativity by being creative themselves, which, in turn, fosters the creativity of their students.

In the Introduction section on "Teaching Teachers," three exemplary chapters illustrate the range of creativity in teaching and teaching creativity and provide conceptual and theoretical background for the topics covered in this book. First, Susan Daniels presents her course (based on the 4C model and creative personality research) to help teachers enhance their own creativity (as well as their K-12 students' creativity), especially via their conceptions of creativity and their self-perceptions of their own creativity. While teaching gifted students is the purpose of the program, the course is broader than just teaching gifted students. The author offers several suggestions for ways teachers can implement the ideas suggested by the 4C model and creative personality research. Second, an international perspective on teaching creativity is presented in the chapter of Magdalena G. Grohman and Krzysztof J. Szmidt. They define creativity, teaching creatively and teaching for creativity, attitudes, and creative attitudes by describing attributes of creative

attitudes, the role of the teacher in developing these, and two programs, one for K-12 and the other for teachers to develop these attributes in themselves and their students. This international view using the arts has intriguing parallels to the Art in Action project which follows this chapter. The integration of Polish literature places discipline knowledge in international context. These program examples lead to the interesting consideration of cultural norms that value creativity and the extent that teachers are able to adopt these ideas pedagogically. Third, Melinda Meyer and her colleagues describe the innovative Art in Action project, which uses various arts (music, visual arts, theater, dance) to teach reading and math to children in grades K-6. The program pairs teaching artists with classroom teachers to develop creative lesson plans. The rationale for the program and its training are provided, as are examples of the work and feedback provided as part of the program evaluation. This exciting program addresses both creative teaching and teaching creativity!

Two main sections follow in this book: Teaching Creatively and Teaching Creativity. While many chapters are written as age or domain specific, the ideas described in these chapters can be applied across the educational lifespan and across disciplines.

In the first section on Teaching Creatively, authors describe various ways educators are teaching creatively at different points in the educational lifespan. Leonard Annetta and his colleagues describe the serious educational games program they developed for high school students. They briefly mention outcomes, including that students' creativity spurs the development of the games. The purpose of "cultivating creativity" is explicitly noted in the chapter. This is an excellent example of how working with technology and student interests increases engagement and learning, as well as enhances creativity.

Sheldon Solomon discusses the development of his nontraditional approach to teaching undergraduate psychology courses that he calls, "*sequential hierarchy of multimodal interdisciplinary recursive experiences*." This approach addresses the limitations of the courses as typically taught where they include disjointed topics and are disconnected from other disciplines. He suggests that courses should be progressive/recursive and multimodal (he uses arts examples). He uses this creative approach to teach introduction to psychology and plans to study its effects on learning and creativity.

Mary Banks Gregerson discusses examples of teaching techniques that are online, on-film, and on-stage and provides some discussion of the influence of standards and ethics, as well as global reach, on the use of these techniques. This chapter is timely in its call to attention of the importance of repurposing popular culture media in teaching and introduces a discussion of standards and ethics that is not clearly evident elsewhere.

Suzanne Court identifies the limitations of traditional methods for teaching music theory, then provides a rationale for her different approach based on cognitive load theory and the multimedia effect, and concludes with an example of a different approach using narrative. This chapter is intriguing in its use of "Big C" creativity as a means to teach creatively with the implication that students' creativity may be facilitated in this domain as well.

David Shapiro and Lenore Walker describe a graduate Forensic Psychology program within a Doctoral Program in Clinical Psychology, including its practicum sites and courses. The authors provide examples of creative teaching and creative work completed by students, and mention future directions, such as their new online program. Their creative approach appears to offer students essential entrée credentials for working in this area while inculcating flexibility, competence, and resourcefulness.

In the second section, authors describe various techniques teachers can use to enhance the creativity of their students, as well as ways to enhance teacher creativity. Apara Ranjan and Liane Gabora discuss how teachers can enhance creativity, outlining key ideas, and using a course project assignment for illustration, as well as other practical examples. The chapter summarizes some key issues in teaching creatively and for creativity that teachers may express concern with (such as evaluation, classroom management, and time) and gives additional suggestions to address these concerns.

Ronald A. Beghetto discusses the role of teachers' responses to student comments in encouraging or inhibiting creative ideas (referred to as "teaching in the micromoments"). The author discusses the techniques he uses to help prospective teachers identify their beliefs and their responses to student comments in a brief simulation.

Reva Friedman describes her creative approach to address her students' (future teachers) beliefs and biases regarding teaching diverse students. She incorporates a spiral approach to conceptualize her three steps (based on synectics, narratives, and playback theater). The first step is examining implicit values where students complete a map titled "who are my people." Then students reflect in a focused fashion by applying their personal insights to examples of situations in the lives of eminent creators. The final step uses Playback Theater techniques for their students to consider the lives of eminent creators and how these examples can apply to themselves.

Heather T. Snyder presents creative assignments she developed for her course on creativity. She discusses brief, regular creative journal assignments as ways to facilitate the learning of course concepts, and a course creative project (comparable to that discussed by Ranjan and Gabora, except with different constraints) as a way to apply course concepts to students' personal creativity. This combination of classical pedagogy with innovative conceptualization models indelibly for students how to foster creativity.

John Baer addresses two issues faced by instructors who want to enhance creativity: Whether training should be domain specific and how to encourage intrinsic motivation even when evaluation is needed. He draws upon his own research and provides practical suggestions for teachers. He argues that training should be domain specific and that teachers should provide some assignments that are ungraded so students can draw upon their intrinsic motivation and take the risks needed to develop creativity.

Dean Keith Simonton's conclusion chapter summarizes some key points from various chapters in the book and situates these notes in the author's own work, both his teaching and research. He includes his own examples of creative teaching to expand upon the examples in the book. The conclusion chapter provides at once

both historical and generalist context for the specific chapters. These broad strokes juxtapose historical and contemporary masters of creativity to anchor solidly each instance of teaching creatively and teaching creativity. Such a conceptual umbrella provides the theoretical shade necessary to contemplate and then apply the value gleaned from each chapter.

While not all teachers may perceive their teaching as creative—or even teaching as a possible domain that could lead to creativity—it most certainly can be. Factors associated with creativity in other domains, such as intrinsic motivation, openness to new ideas, passion, curiosity, play, expertise, and supportive environments are clearly associated with creative teaching, as reflected in the contributions to this book. These chapters inform and provide guidelines for increasing teachers' and students' creativity. They also may inspire, energize, and otherwise excite those aspects of us that allow us to teach creatively.

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Acknowledgments

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Part I
Introduction: Teaching Teachers

Chapter 1
Facilitating Creativity in the Classroom: Professional Development for K12 Teachers

Susan Daniels

Over the last two decades, research has found that K12 teachers tend to devalue creativity in students, to some extent because creativity is associated with nonconformity, impulsivity, and classroom disruptions (Beghetto, 2007; Cropley, 1992; Dawson, 1997; Kaufman & Beghetto, 2009; Scott, 1999; Westby & Dawson, 1995). With the twenty-first century skills framework (Trilling & Fadel, 2009), the work of the Partnership for twenty-first century skills (http://www.p21.org) and ASCDs position on Curriculum 21 (Jacobs, 2010), these perceptions are beginning to shift (Daniels, In Preparation).

These frameworks place an emphasis on creativity, collaboration, and problem solving as essential for learning and life in the twenty-first century. Yet, while more teachers report their belief that creativity is important for learners in the twenty-first century classroom, they also often state: "I do not know how best to support creativity in the classroom," and "There is no time to add creativity in the class day." They also ask "How do I know if I am creative?" and, "Do I need to be more creative to help my students develop their own creativity?" (Daniels, In Preparation).

In this chapter I will describe an 8-week professional development program that has been used with in-service teachers in K12 settings to increase their understanding of creativity, while emphasizing their own—and their students'—creative characteristics and creative potential. Strategies to foster, nurture, and support creative behavior in teachers and students are integrated throughout the chapter.

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Creativity Is Important, But. . .

The in-service teachers that I work with are taking an educational psychology course titled "Creativity, Thinking, and Problem Solving" for graduate credit, or they are participating in the course not for graduate credit but as part of a school district's professional development program. Instruction, classroom experiences, and assignments are the same for all of the teachers—whichever route has brought them to the class.

"Creativity, Thinking, and Problem Solving" is the third course in a three-course graduate certificate program in gifted education for credentialed teachers. All courses are taught with a strong emphasis on the theory-to-research-to practice model, and all assignments have an applied emphasis.

The first two courses consist of (1) Introduction to teaching the gifted and talented and (2) differentiated curriculum and instruction. We take a very broad view of giftedness in this program, explicitly identifying and building upon student strengths, and the graduate students develop a wide range of capacities for enhancing the curriculum through differentiating content, process, pace, and product choices according to varied student readiness, interests, needs, and learning preferences.

This final course also takes a broad view of creative development, so discussion of creative giftedness constitutes just a portion of the course. The underlying theoretical framework that provides the foundation for the course is based on the Four C model of creativity, bringing with it the emphasis that we all have creative potential, and the *mini-c* perspective that creativity can be taught, fostered, and nurtured everyday in small, but meaningful ways (Kaufman & Beghetto, 2009).

So this group comes ready with the knowledge that diverse learners have diverse learning needs, that choice is a key motivator, and that both consistency and novelty are important for engaging students in their own learning and in maintaining that engagement over time. Prior to our first class meeting, the cohort of students has been assigned readings in three complementary texts: *Twenty-first Century Skills: Learning for Life in Our Times* (Trilling & Fadel, 2009), *Nurturing Creativity in the Classroom* (Beghetto & Kaufman, 2010), and *Transformers: Creative Teachers for the twenty-first Century* (Schrek, 2009). Through this background reading the teachers come to class with the knowledge that creativity is coming to the fore as an essential capacity for success in learning, career development, and ongoing growth and fulfillment over the course of one's lifespan.

Nonetheless, when surveyed at the first class meeting, these same students inevitably convey some confusion, perplexity and conflict, alongside strong personal convictions regarding creative development as evidenced in their responses to the following questions:

1. How do you define creativity?
2. Are you creative? In what ways?
3. Is creativity important for learning? If so, how so?
4. Can creativity be enhanced or are you just "born with it?"
5. Does creativity have a place in the classroom?

Responses vary. For instance, in response to the first question, "How do you define creativity?" many respond by describing creativity as something "new, novel, and unique" and also by citing examples of the world-renowned creativity of Albert Einstein, Georgia O'Keefe, Mozart, Da Vinci, and others. In response to the second question "Are you creative? In what ways?" many teachers, after completing the readings, will say something to the effect that they never thought they were creative. However, they find they are beginning to think differently about their own creative behaviors, because they "change up recipes all the time" or they "are creative in the garden, learning about and designing a xeriscape yard" both as a personal aesthetic expression and as a means of water conservation.

Making everyday acts of creativity apparent through eliciting individual examples, through this sharing of personal experiences, and as elaborated through further class discussion is a true "aha" moment and sets the tone for the rest of the course. Creativity becomes personal, and the eminent acts of life-changing creativity are reconsidered from a different vantage point, thereby beginning discussion of different types, forms, or levels of creativity. This is where ideas of mini-c and little-c, to be elaborated in the following section, come in to the classroom discourse and begin to change the classroom climate around both implicit and explicit notions of creativity. The broader notion of what constitutes creativity is considered and reconsidered. The closer consideration of mini-c and little-c creativity affects change in teacher self-concept as pertains specifically to their own personal creativity (Richards, 2007).

The Four C Model of Creativity

The Four C model was designed in response to an earlier Big-C/little-c model of creativity. The Big-C/little-c model of creativity was useful in underscoring the eminent and lasting contributions of mavericks in varied domains while "also recognizing the more incremental (but still important) contributions made by everyday people" (Kaufman & Beghetto, 2009, p. 2). Yet, the more nuanced aspects of creativity and the creativity of children at work and at play were not included in the B-C/little-c model nor were the accomplishments of professionals who work creatively in a domain without recognition as creative geniuses. Therefore, the Four C model is notable for introducing and valuing *mini-c* creativity which is best understood as experiences of transformative learning and which are personally meaningful interpretations of experiences, actions, and insights; *little-c* refers to everyday problem solving and creative expression that may be linked to hobbies, avocations, careers, and extracurricular pursuits—activities that are a bit more public and receive input, feedback, and response from others; *Pro-c* refers to professional level creativity and is exhibited by people who are professionally or vocationally creative but not eminently creative. Finally, *Big-C* is reserved for those who are considered truly great in their field and whose accomplishments have lasting impact on culture and their field posthumously.

The model was developed to help distinguish more clearly between the natural individual everyday participation in mini-c creative activities, the creativity of one who works creatively within a particular domain (e.g., the visual arts, astrophysics etc.), the professional who was domain competent and recognized as creative, and the creative genius. The four-c model was also intended to help provide a useful framework for analyzing creative processes in individuals.

The Creative Person—Personality Plus

The creativity studies of Csikszentmihaly (1996) indicate that *personality* and *value differences* characterize young people who choose and select to engage in creative endeavors: young children engaged in creative activities—in school, at home, or in extracurricular pursuits; adolescents in creative hobbies, avocations, and early career pursuits; and young adults who carry this creative inspiration with them into college and career choices. Further, Csikszentmihaly found these personality and value differences differentiate those who sustain creative activity and are active in creative pursuits across the lifespan.

Csikszentmihaly (1996) opened his chapter on "The Creative Personality" with: "Creative individuals are remarkable for their ability to adapt to almost any situation and so make do with whatever is at hand to reach their goals" (p. 51). A simple, forthright, and applicable description, yet further in the chapter, he discusses the complexity of the creative personality and several seeming paradoxes inherent in creative individuals. For example, creative individuals tend to have great stores of energy as well as a need for rest and alone time.

Nurturing Creative Personality Traits and *mini-c* Creativity in the Classroom

The "Creativity, Thinking, and Problem Solving" course I teach focuses on *mini-c* creativity as experienced in classroom settings along with developing an understanding of how supporting characteristics of creative people within the classroom benefits and enhances creative opportunity for the class as a whole—both teacher and students. The first half of the course links developing an understanding of personality characteristics associated with creativity to ways to support those characteristics while also nurturing and cultivating opportunities for the development of *mini-c* creativity. The second half of the course focuses on assignments that grow from these earlier creative personality and *mini-c* explorations.

While creative individuals—by definition—are unique, they also possess some personality traits in common (Daniels, 1997; Feist, 2010; Helson, 1999: Richards, 2007). Creative people in varying degrees and combinations tend to be—or have:

1. Awareness of creativity
2. Imagination
3. Independence
4. Risk taking
5. High energy
6. Curiosity
7. Sense of humor
8. Attracted to complexity
9. Artistic interests/aesthetic perspectives
10. Open-mindedness
11. Need for alone time
12. Perceptive

Let's look at these in greater detail.

Awareness of Creativity

Creative individuals tend to be aware of their own creativity and this creative awareness can in turn lead to heightened awareness of others' creativity and creativity in the environment as well. In addition, such metacognitive understanding of creativity serves to be self-reinforcing. A certain "creativity consciousness"—receptivity to and valuing of creative ideas and innovations—seems to underlie and support an individual's creative potential.

Awareness of creativity can be enhanced in the classroom through explicit instruction about creativity, including the material in this chapter, as well as by including classroom discussion of students' creative interests and pursuits. For even very young students, explorations of everyday creativity can be fostered and discussed.

Imagination

Originality and imagination are part and parcel of the creative personality as well as the creative process. Creativity lends itself to fantasizing, daydreaming, and other imaginative forays. Imagery plays a key role in creative thinking and conceptualizing (Daniels, 1995). Creativity often engages more deliberate forms of mental imagery in everyday thinking and problem solving, and more creative individuals have been reported to have more control over these mental representations (Flowers & Garbin, 1989). Singer (1999) stated, "The great human capacity for imagery, that is, reproducing mentally an object, event, or face and associated sounds, tastes, touches, or smells even after they are no longer present in one's sensory field, is usually an important feature of imagination" (p. 14).

These capacities can be readily integrated across the curriculum. Deliberate use of imagination is called upon to write an original story or play, create a fictional diary from a child in a different time, contemplate new designs for energy efficient houses in the twenty-first century, or create a sculpture to represent an abstract concept. The possibilities are seemingly limitless.

Independence

Independence is central to creativity. The creative individual must be ready and willing to make waves, to go against the crowd, and at times to stand alone. Independence can manifest in a variety of ways: by standing apart from one's peers in viewpoint, appearance, activities, and a host of other personal choices. At other times, independence will emerge in the form of a direct challenge toward a parent or teacher. A certain understanding and self-confidence is necessary on the part of classroom teachers to understand and facilitate the creative tendency of a child, while also setting appropriate boundaries and limits.

Independence is closely related to intrinsic motivation, and intrinsic motivation is closely related to choice. True choice in the classroom—of reading, writing, inquiry, and project-based learning—supports the independence associated with creativity. Students work independently with mentoring and coaching as needed in a "just-in-time" teaching approach.

Risk Taking

Creativity brings with it at least a modicum of risk taking: intellectual, social, psychological, and emotional risks. Whenever a unique approach or opinion is ventured, the creative individual risks rejection or even isolation. Some, particularly those who are highly physical or talented in the bodily kinesthetic realm may be inclined to take physical risks as well.

These are instances when careful guidance, support and balance of limits and choices are essential to the well-being of students in the classroom.

High Energy

It is not surprising that *driving absorption*, *passionate interest*, *intense dedication,* and *unwilling to give up* are all phrases used to describe the energy, perseverance, commitment, and motivation of creative individuals (Amabile, 1989). Such energy and drive are often evidenced in early childhood and maintained into adulthood. Most creative accomplishments are not the result of a spontaneous event or of an overnight discovery but of a lifetime of work and commitment to a particular field or endeavor.

The roots of this persistence can be seen in the energy—and time—that young creative children devote to their projects, often forgetting about lunch and play dates with friends they are so engrossed and absorbed in their project of choice.

One drawback to the highly structured curriculum most districts implement in response to No Child Left Behind and the demands of high stakes testing is that curriculum is broken down into packets of information, and neither time nor classroom structure supports this energy and the drive of creative students to pursue their interests in depth and with zeal. One strategy that some teachers use is compacting the curriculum to "buy" time for immersive project work, even if it is just for one extended period of 90 minutes or 2 hours once a week.

Curiosity

Along with creativity come curiosity and questioning. The creative impulse inclines one toward exploration and investigation. "How does this work?" "How can we make it better?" "Why is it like that?" "Can it be like this instead?" "Why couldn't we do it this way also?" are considerations that often compel the curious and creative child to understand, to interact with, and to effect change on aspects of their environments.

Curiosity is a quality that, when examined closely and discussed with classroom teachers, most will say they value. Yet, endless questions during a class period can be perceived as disruptive in terms of their impact on the pace of a teacher's lesson. One strategy that I acquired somewhere along my travels to various educational conferences is the idea of an "I/Q" sheet. Students keep these on their desks and right down important ideas on one side and quotes and questions on the other side. This is a way of communicating to the students that you value their thoughts and questions, but they may need to be addressed at a later time. Then, it is important to follow up with that time to explore those "saved" questions.

Sense of Humor/Playfulness

Humor is associated with an ability to approach problems, and life in general, in a fresh, childlike, and playful manner. Humor in the form of puns, satire, and farce engages the imagination in approaching a topic with an unusual "twist." A unique juxtaposition of ideas, words, and images often lends a humorous note to a creative product. Numerous inventions and creations have resulted from fooling around with ideas and playing with possibilities, in contrast to more rule-bound approaches and traditions.

Humor is a delightful diversion, stress reliever, and, at times, an advanced—or sophisticated—response to classroom curriculum. Humor unbridled can, however, be disruptive and disrespectful. Fostering humor in the classroom requires that an understanding be forged with teacher and students to be respectful as well as funny.

Spontaneous moments may occur as a positive addition to the class, and carving out time for "The Laughing Classroom" every now and again or for a talent show is a solid and enjoyable creative enrichment opportunity.

Attracted to Complexity

Creativity is not a simple concept or process. Often creative enterprises bridge disciplines, styles, materials, techniques, cultures, geography, and periods. Creative people tend to be drawn to complexity. Creative kids often enjoy making the simple complex! Thus, an environment rich, and varied in resources, materials, and modes of interaction may contribute to an increase in creative activity.

A project that I have used and many of my teachers have used—with a wide age range and with the same group often more than once—is the "Rube Goldberg Conundrum." The task is how to make the most complex machine or device to solve the simplest problems or challenges. These have varied from creating the most complex machine to pour a glass of water and the most complex machine to turn off a light. Often these include levers, pulleys, and dominoes and also zip-line Barbies, catapulted stuffed animals, and repurposed kitchen devices. Great fun, complex yet often also a bit giddy; goggles are often recommended.

Artistic and Aesthetic Perspectives

In Csikszentmihaly's studies, art students were found to hold social and economic values in lower esteem and they ascribed to aesthetic values more than average high school or college students. The more original the art student, the more extreme were her standards of a personal aesthetic. Many creative scientists were also found to value a personal sense of aesthetics and elegance over commercial reward or recognition (Miller, 1996). This personal sense of aesthetics is apparent in even very young creative children (Craft, Cremin & Burnard, 2008).

When I speak with my graduate students about these qualities, we discuss that having an artistic or aesthetic perspective or preference does not necessarily correspond directly with an ability to draw or paint or work in another artistic medium. However, creativity often brings with it an appreciative quality in terms of artistic and aesthetic aspects of life, art, science, and so on that others may not notice. Giving time, consideration, discussion, and attention to aesthetic details and elegant solutions is essential to support this tendency in creative youth. One elementary teacher specifically set meeting times with her class to discuss the aesthetics of their classroom and how to improve them. Space was cleared from the window area, live plants were brought in, as well as a small salt water fish tank, one wall was painted, and one student began a study of *feng shui*—a Chinese study

of design principles based on geometry and spiritual associations, sharing his findings at their class meetings.

Open-Mindedness

Creative individuals tend to be open-minded, willing to consider possibilities, and able to tolerate ambiguity while contemplating an idea. Open-mindedness, though not necessitating a complete rejection of convergence or convention, approaches what *is* as a starting point for what *might* be—a starting place for more original explorations of what might be possible in a future context. Being open-minded, on the other hand, does not imply that one is indecisive, wishy-washy, or incapable of thinking for one's self. After considering various alternatives, an open-minded person will often take a firm stand on a position and act in alignment with that view. The opposite of open-mindedness is called *myside bias* which refers to the pervasive tendency to search for evidence and evaluate evidence in a way that favors your initial beliefs.

Open-minded students will say "How might we look at this differently?" "What would happen if..." "Could this be modified and made more unique and/or useful?" and so on. These are questions that then may lead to story revisions, science project redesign, individual artistic renderings and so on.

Need for Privacy and Alone Time

Wallas's (1926) analysis of the creative process included four stages: preparation, incubation, illumination, and verification. *Preparation* is foundational in this view, as it is the stage that involves exploring, clarifying, gathering, and reviewing data; collecting resources and materials, and so on. Then next stage, *incubation*, is perhaps the hallmark of the Wallas model. Incubation is a period of during which the creative activity or problem is, deliberately or incidentally, put out of one's mind. Incubation is a period of preconscious, fringe-conscious, or unconscious processing during which one is not giving the creative project or idea deliberate attention. Instead, one is involved in another activity such as resting, reading, walking in the woods, or possibly even sleeping. It is after such periods of relaxation and reflection that the *Aha!"* associated with *illumination* in the creative process often occurs.

Numerous creators in wide and varied fields have reported a need for extended periods of solitude for nurturing and exploring creative ideas. Our classrooms and our students' after school lives tend to be highly scheduled. Free time or time to work alone on an independent project will help accommodate the creative need to contemplate and reflect.

Perceptive

Creative children, and adults, are frequently sensitive and intense (Daniels & Piechowski, 2010). They take in much through their senses and are particularly sensitive to stimuli from the environment, especially with regard to the following: identifying patterns, discerning details, and noticing both similarities and distinctions among seemingly disparate entities, items, or ideas (Daniels-McGhee & Davis, 1994; Torrance, 1962). For children, life is a creative adventure. Every sight, smell, taste, sound, and touch has creative potential. Exploring the world through one's senses and perceptions is the essential creative work of children. Maintained, or rejuvenated later in life, exquisite perception provides inspiration across domains, levels of development, and levels of creative expression. Such heightened awareness is also what enables the creative individual to see past the obvious and, in noting, fine points, to see possibilities where others may not.

There is a program called *The Private Eye* in which students use jeweler's loupes to look closely at natural and man-made artifacts and then ask the questions: "What does this look like?" and "What does this remind me of?" This program fosters close observation and analysis alongside using analogy to broaden associations and provides opportunity to connect critical and creative thinking through the act of close perception. The possibilities are extraordinary for analyzing patterns and design in nature and in craft and design, making associations to other items and objects, and using this process as a springboard for generating one's own designs and inventions.

Creative Classroom Culture

Understanding and nurturing mini-c and little-c in the classroom and understanding and nurturing the characteristics associated with the creative personality in the classroom become the focus of the work for the teachers over the quarter. As graduate students and credentialed teachers participating in a district-sponsored professional development program, assignments are constructed to take our classroom learning into the teacher's home classrooms.

Four main assignments have been developed to highlight the central themes of the course (1) nurturance of *mini-c* and deliberate development of *little-c* experiences in the classroom through lesson modification or curricular unit revision, (2) reflection upon and documentation of their own creative characteristics as well as the creative characteristics of their students as observed on a daily basis—usually documented in a journal or daily running record form on the computer, (3) a professional development plan to consciously attend to and enhance one's own mini-c creativity on a daily basis—with a presentation at the last class, and (4) a case study of a student with seemingly high creative potential—with a presentation

at the last class. When these assignments are pursued simultaneously there is an interaction that inevitably changes the climate of the classroom.

Qualitative responses from an end-of-class survey consistently indicate that: raising awareness of creativity in the classroom, alters the classroom climate; valuing creativity, alters the classroom climate and the teacher's and students' creative self-concept; and increasing time for creative activity, increases motivation to pursue creative projects (Daniels, In Preparation).

In this chapter, I have described the major components of the "Creativity, Thinking, and Problem Solving" course that I am fortunate to teach each year. We have looked at the Four C model of creativity and its implications for teaching, enhancing understanding of creative characteristics with applications for school classrooms, and assignments for teachers to build upon their own creative capacities. I strongly recommend the reader consider pursuing these—even if you are not able to attend my class the next time it is offered. Most of the strategies recommended herein can be adapted and applied without further instruction with benefit for the whole class—teacher and students alike. Simply put, we must consider the role of the teacher, creatively enhanced classroom activities and classroom climate, and our own creative potential as well as the creative characteristics of our students, if their creative potential is to be acknowledged, appreciated, and developed.

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Chapter 2
Teaching for Creativity: How to Shape Creative Attitudes in Teachers and in Students

Magdalena G. Grohman and Krzysztof J. Szmidt

Thriving in ever-changing conditions of the twenty-first century calls for innovative education. If our students are to anticipate changes and their consequences, whether on the individual or societal level, mere adaptation is no longer sufficient (Fisher, 2005). Nowadays students and educators have no choice but to be creative. As pointed out by Tatarkiewicz (1982), an eminent Polish philosopher, creativity is inevitable, because every aspect of our lives depends on it—our well-being and our aesthetic experiences, technological advances and discoveries, and fulfillment of societal and individual goals.

If creativity is indeed inevitable, the question of whether it ought to be taught loses its significance. Rather, educators need to be concerned with the issue of *how* creativity can be nurtured in students and teachers.

In the following sections of this chapter we focus on creative attitude and its role in the creativity of students and teachers; we discuss, as well, how to shape creative attitude during comprehensive systematic programs for students and teachers. Most importantly, we share our pedagogical experiences through two examples of such programs: Creativity Lesson and the Summer Seminar in Teaching for Creativity.

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Creative Attitude in Teaching for Creativity

There is a growing recognition among creativity researchers and educators that in order to enhance creativity in our students and teachers, the emphasis should be on shaping *creative attitude* (Davis, 1999; Plucker, Beghetto, & Dow, 2004; Plucker & Dow, 2010; Schank, 1988; Szmidt, 2001a), *creativity habit* (Sternberg, 2010), or *creative way of life* (Maslow, 1968; Suchodolski, 1975). But how should we as educators go about this "shaping?" Is it enough to throw in some brainstorming or SCAMPER checklist (Eberle, 1996) in the lesson content, thus making learning fun? Or should our efforts be more comprehensive and include motivation to learn creative behavior and creative thinking? In the following sections we discuss how creative teaching is differentiated from teaching for? creativity, where creative attitude can be placed in the concept of creativity, and finally—how creative attitudes can be developed.

Distinction Between Teaching for Creativity and Teaching Creatively

Jeffrey and Craft (2004) offer a clear distinction between *teaching creatively* and *teaching for creativity*. While teaching creatively means applying imaginative approaches to "make learning more interesting and effective" (p. 1), teaching for creativity focuses on teaching attitudes towards creativity, and teaching how to develop students' creative thinking skills and behavior. Jeffrey and Craft warn educators, however, that formulating such distinctions may, in fact, lead to valuing some educational practices over others. They emphasize a combination of the two approaches if teaching and learning is to be effective. Each approach adds a valuable component to students' education. By developing materials and approaches that motivate students to learn, teaching creatively impacts the level of ownership and control in the learning process and innovation in thinking. The concept of teaching for creativity, on the other hand, focuses on encouraging young people to believe in their creative identity and creative abilities, and on fostering creativity by curiosity and "learner inclusive" pedagogy, where the learner is encouraged to engage in identifying and exploring knowledge (2004).

While both aspects are undoubtedly important for the twenty-first century education, we would like to focus on teaching for creativity, with its central concept of creative attitude, and how it can be developed and shaped through established and verified pedagogical practices (Szmidt, 2007). Before we do so, however, let us do the topic justice and describe the concept of attitude in the context of creativity.

Creativity, Creative Attitude, Creative Skills

The most agreed upon definition of creativity includes the characteristics of a creative person, creative process, creative place, and creative product (Kaufman, 2009; Plucker et al., 2004). Based on their extensive literature review and content analysis, Plucker et al. (2004; see also Plucker, Beghetto & Dow, 2004) propose that: "Creativity is the interaction among *aptitude, process, and environment* by which an individual or group produces a *perceptible product* that is both *novel and useful* as defined within a *social context*." (italics in original; p. 90).

Plucker et al. (2004) place great emphasis on the interaction between these components, which in turn encourages looking at creativity as a dynamic structure. Thus, we can easily imagine that by enhancing (or impairing) at least one of the components of such a dynamic structure, the odds of a creative behavior or product occurring increases (or decreases; 2004). Needless to say, this conceptualization of creativity bears great implications for education.

We evoke this particular definition of creativity for yet another reason—the concept of aptitude. According to Plucker et al. (2004), aptitude represents a dynamic set of characteristics (e.g., openness, tolerance for ambiguity, flexibility in thinking, perseverance, motivation for creativity, need for self-expression), as well as abilities pertaining to the creative process, that can be shaped by experience, learning, and training (see also Feist, 2010; Plucker & Dow, 2010). Interestingly, what Plucker and others call "aptitude," others have referred to as "creative attitude" (Davis, 1999; Maslow, 1968; Schank, 1988; Sternberg, 2010; Szmidt, 2001a).

Social psychologists define attitude as a positive or negative evaluation of a particular object (Olson & Zanna, 1993). Others emphasize that attitude is a relatively stable and coherent organization of knowledge, beliefs, feelings, motives, behaviors, and emotional expressive reactions that refer to a given object (Dobrołowicz, 1995; Mądrzycki, 1977; Mika, 1984; Plucker & Dow, 2010, for an extensive review see Olson & Zanna, 1993). And, according to Olson and Zanna (1993), a strong and easily accessible attitude towards an object is more likely to influence the interpretation of relevant information "and shape behavior in a direction consistent with the attitude" (1993; p. 122). Consequently, a strong positive attitude towards creativity—or creative attitude—can be expressed as a set of knowledge and beliefs about creativity, positive affect associated with creativity, and favorable behavioral responses toward creativity. If such attitude is strong and easily accessible, it will influence interpretation of any information or facts about creativity, as well as impact one's behavior.

It is not surprising then that for decades now, psychologists and pedagogues have seen the basis of creativity in attitudinal and motivational aspects of a person (Basadur & Hausdorf, 1996; Davis, 1999; Dobrołowicz, 1988, 1995; Drat-Ruszczak, 1981; Kielar, 1981; Kujawiński, 1990; Schaefer & Bridges, 1970; Schank & Childers, 1988; Sternberg, 2010; Szmidt, 2001a; Szymański, 1987; Trojanowska-Kaczmarska, 1971; Turska, 1994; Wiechnik, 1996; Wojnar, 1976).

Korniłowicz (1976) introduced the concept of creative attitude to Polish pedagogy in 1926, more than thirty years before American humanistic psychologists put forth their understanding of creative attitude (Fromm, 1959; Maslow, 1968; Rogers, 1961). One of the components of creative attitude that Korniłowicz underlines is *the ability to create*, a disposition that anyone can demonstrate, regardless of the level and kind of other specific skills or talents. This general ability to create (or *creativeness*, see Davis, 1999; Karwowski, 2009; Szmidt, 2001a) coexists with a motivational factor—*dynamic inner directivity*—that guides cognitive and emotional processes (cf. to contemporary works by Teresa Amabile). The major role of this dynamic inner directivity is to organize the creative process into a dynamic structure of meaningful interconnected actions (Korniłowicz, 1976). Another Polish pedagogue and Korniłowicz's contemporary, Radlińska (1935, 1961), emphasizes behavioral and prospective aspects of creative attitude. According to Radlińska, creative behavior and attitude towards life allows for resilience against negative influences of social environment, as well as for assuming actions that transform one's life and social environment.

Currently, psychologists and pedagogues tend to relate creative attitude to personality, thus using sets of traits that describe cognitive, affective, and behavioral facets of attitude towards creativity. For instance, Dobrołowicz (1995) sees the following characteristics as central to creative attitude: imagination, creative thinking, ideation, flexibility, originality, engagement in hobbies, exploration, and the need for improvement. Others add to the list openness, inquisitiveness, independence, courage, consistency, perseverance, tolerance for ambiguity, responsibility, positive self-esteem, expressiveness and emotional changeability, high energy, humor, artistic and aesthetic interests, need for time alone, perceptiveness and intuitiveness, emotional sensitivity, empathy and idealism (Amabile, 1996, Csikszentmihalyi, 1997; Davis, 1999; Eysenck, 1997; Kozielecki, 1992; Nęcka, 1995; Piirto, 2010; Popek, 1990; Schulz, 1990; Simonton, 1999; Sołowiej, 1997; Sternberg & Lubart, 1995; Trzebiński, 1980).

Popek (1988, 1990, 2000), the author of the most comprehensive theory of creative attitude in Polish literature to date, offers another interesting perspective on the matter in question. He defines creative attitude as a dynamic structure consisting of cognitive and character-related components, and claims that such structure is a drive behind the transformation of our personality as well as objects around us. The cognitive component refers to intellectual abilities that have to do with observation, sensitivity, and—generally speaking—transformation of information. It captures dispositions that can be described on the continuum from algorithmic (e.g., copying) to heuristic (e.g., transformative thinking) patterns of behaviors (1988, 1990, 2000). The character-related component, on the other hand, includes a spectrum from conformist to non-conformist behaviors, and highlights such traits as independence, flexibility, courage, openness to experience, high self-esteem, and engagement in various activities (hobbies or interests). Interestingly, the character-related component has a superior role in relationship to cognitive skills—it governs the effective realization of cognitive abilities. Based on his extensive research, Popek proposes that creative attitude is a combination of

heuristic and non-conformist dispositions, and it can be identified in any complex behavior that has to do with innovation and self-realization. On the other hand, the combination of algorithmic behaviors (copying, reproducing, rote memorization) with conformist dispositions defines attitudes that do not foster creativity (2000).

As we have seen, creative attitude is a rich and broad concept. It includes an array of cognitive, self-efficacy skills and character-like traits (Davis, 1999; Piirto, 2010; Popek, 1988, 1990, 2000, Szmidt, 2001a), personality (Dobrołowicz, 1995), as well as affective, motivational, and behavioral characteristics (Szmidt, 2001a) that have been found in creative people across the levels of creativity and across domains.

Creative Attitude in Education

Earlier we pointed out that attitudes towards an object have a certain strength and accessibility (Olson & Zanna, 1993): the stronger the attitude, the easier the accessibility becomes. Furthermore, attitudes are dynamic and interactive structures of cognitive, affective, and behavioral dispositions (Szmidt, 2001a, 2007). Those two characteristics of attitudes have tremendous implications for education. Consider this: if a teacher or a student holds a strong negative opinion about creativity—he or she believes that creativity is not for everybody, for instance—it will affect his or her behavior toward creativity, in the sense that certain activities that require creativity may be avoided. However, if educators create an opportunity for students to actually engage in creative behavior, it is likely that such engagement will impact the initial negative attitude: students might be more likely to appreciate the value of creativity and, in the end, have a more positive attitude towards it (Keong & Soon, 1996). In other words, because of the dynamic and interactive nature of attitudes, it may be enough to impact one aspect of creative attitude, for instance behavior, for the change in the evaluation of creativity to occur (2001a, 2007).

The dynamic and interactive structure of creativity attitude, with its cognitive, affective and behavioral dispositions, has become the cornerstone for the pedagogical practices proposed by Krzysztof Szmidt (2001a, 2001b, 2008a, 2008b). According to Szmidt, creative attitude allows people (students, children, teachers) to reorganize their existing experiences, and to discover and construct something new and valuable to them (things, ideas, ways, way of perceiving the world). Creative attitude defined this way can be seen not only in artistic, scientific and inventive activity but also in hobbies and social activities (e.g., philanthropy); it can be reflected in everyday as well as in eminent creativity (Modrzejewska-Świgulska, 2009a, 2009b; Richards, 2007). Furthermore, such explicit definition of creative attitude helps to identify desirable characteristics of a *creative person,* which in turn leads to formulation of specific programs and curricula in education for creativity (Szmidt, 2001a, 2001b).

Teaching for Creativity: Examples

In the previous sections we discussed the theoretical context in which the concept of creative attitude is defined. We placed emphasis on the dynamic and interactive structure of creative attitude and its components—cognition, motivation and affect, and behavior, and how changes in one component can lead to changes in attitude towards creativity. It seems that enabling such changes is the most fundamental approach educators can take to enhance their own creativity and the creativity of their students (Kujawiński, 1990; Plucker & Dow, 2010). Within this context, we would like to present two examples from our educational and pedagogical practice—a Creative Lessons Program for students and the Summer Seminar for teachers.

Creativity Lessons for Students

The rationale behind the Creativity Lessons is the growing agreement throughout the USA, Western Europe and Poland that education in twenty-first century should be education for creativity and innovation (Craft, 2011; Partnership for 21st Century Skills, 2009; see http://www.p21.org/storage/documents/P21_Framework_Definitions.pdf; Szmidt, 2001a, 2007). In particular, Craft (2011) emphases that creativity has been increasingly seen as a set of abilities and attitudes; it has significant implications not only for creativity identification and measurement, but for teaching as well (2011).

Thus, the Creativity Lessons Program postulates that (a) students at every level of education ought to be prepared to shape the culture of the society in every domain: science, art, literature, philosophy, religion, etc.; (b) students ought to be prepared to work creatively (compare Partnership for 21st Century Skills, 2009); (c) they ought to be prepared to face social changes; and finally; (d) they ought to be prepared for self-development and self-realization. Students who possess these skills can—to a greater degree—tolerate ambiguity, explore new possibilities, express their own thoughts and feelings, and understand the perspective of others (Szmidt, 2001a, 2001b).

The Goals of the Creativity Lessons

Creativity Lessons Program, developed and tested in action research conducted by one of the authors and his colleagues (Szmidt, 2001a) is a systematic and usually a yearlong effort to teach how to think, feel and act creatively. Lessons are designed to develop each of the three aspects of creative attitude through solving everyday life problems and fostering students' creative potential. Specific goals of the

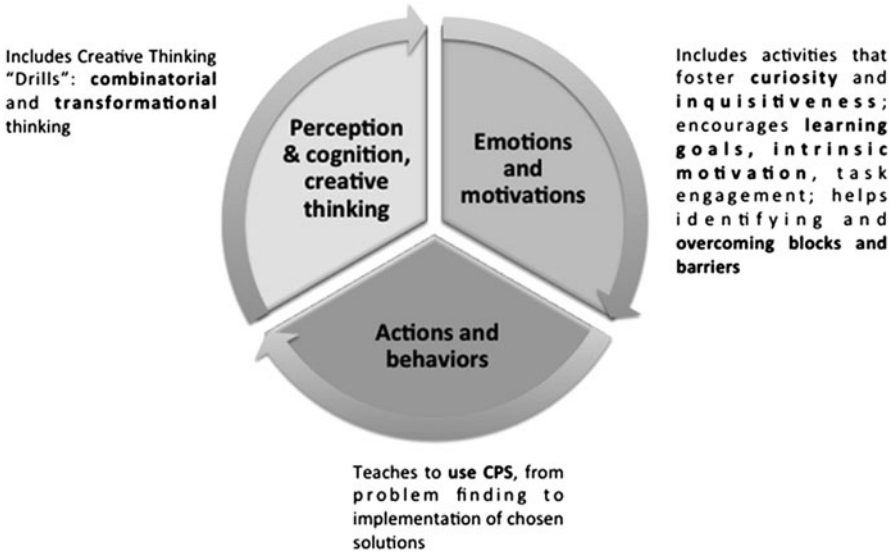

Fig. 2.1 Creative attitude structure and competences trained during the Creative Lesson Program

creativity lessons are related then to creative cognition, motivation and affect, and behavior (see Fig. 2.1).

For example, the following specific goals guide learning during the creativity lesson designed for students 11 through 14 years of age (Szmidt, Rakowiecka, & Okraszewski, 1996):

- *Cognition* to develop and enhance creative thinking skills, skills to associate, to use analogies and metaphors, to transform ideas; to actively forage for relevant information, and to analyze that information, ideas and problems; to learn to anticipate the consequences of one's creative actions, to understand basic sciences and integrating knowledge from different domains.
- *Emotion and motivation* to develop, incite and sustain curiosity; to help to identify creative potential and to overcome the barriers related to cognition, motivation and emotions; to develop a positive approach to problems and ideas and to aspirations; to foster openness to different ideas, different points of view, assertiveness in expressing feelings and critique; encourage teamwork, empathy and tolerance for differences (racial, cultural, ethnic).
- *Behavior and action* to encourage being proactive for the benefit of others at school, among friends, in families, and for the benefits of students themselves; to encourage action in situations that are ill-defined and uncertain; to develop abilities to solve problems and to implement its solutions, and to initiate and implement changes.

The Tasks in the Creativity Lesson

The tasks that students tackle during the creativity lessons are typically ill defined, authentic, everyday life problems related to students' experiences at school, at home, and in their communities (cf. Groborz & Nęcka, 2003; Groborz & Ślifierz, 2003; Runco & Chand, 1994; Starko, 2010).

Each task addresses a specific learning goal related to one or all of the creative attitude components. For instance, to enhance the cognitive component, the teacher may assign activities that have to do with combining ideas, associating or analogizing; to work on affective-motivational component, students may engage in tasks and problems that help to eliminate such barriers in creativity as premature closure (focusing on the first idea that comes to mind; cf. Ripple, 1999). Other sets of activities focus on the third component of the creative attitude—creative action. Through these activities, students learn to use analytical, as well as intuitive methods of problem solving such as synectics (Gordon, 1961) and brainstorming.

Szmidt (2001a, 2008a, 2008b) stresses also that the activities, problems, and tasks used during the creative lessons are heuristic in nature; that they require using various ways, steps, and means to do the task or solve the problem at hand (see also Amabile, 1996).

The Rules of the Creativity Lesson

The Creativity Lessons Program requires that teachers and students follow a set of rules that organize and foster creativity in the classroom (Amabile, 1992; Cropley, 1992, 1997; Dobrołowicz, 1995; Fisher, 2005; Góralski, 1990; Khatena, 2000; Kujawiński, 1990; Lewowicki, 1977; Limont, 1994; Lynch, Harris, & Williams, 2001; Nickerson, 1999; Puślecki, 1998; Ripple, 1999; Sternberg & Lubart, 1995; Szmidt, 2001a; Torrance, 1962). Szmidt (2001a) distinguishes the rule of humor and play, the rule of emphasizing creative process over creative product, and the rule of removing/preventing barriers in creativity. Another rule refers to developing intrinsic motivation, with emphasis on suspending grading during creativity lessons and on encouraging students to evaluate their progress on their own. The rule of facilitation entails that a teacher facilitates the learning process and the development of creative abilities through empathy, authenticity, openness, assertiveness, and acceptance of who the students are. Szmidt (2001a) suggests also that the rule of the contract—the ultimate regulator of the relationship between the students and the teacher—is applied in the classroom. Such a contract allows the students to decide how they will go about the problems and tasks, and how they will regulate interactions and communications between one another. It teaches them responsibility, encourages initiative, and grants them ownership of the learning process (Amabile, 1992; Craft, 2005).

Finally, let us focus on the most important rule that Szmidt (2001a) formulates—the rule of the teacher's creativeness. A teacher who facilitates the creativity lessons does not have to be a Big-C or even Pro-c artist, inventor, or scientist; it is enough that he or she is creative in the realm of instruction and pedagogy, cares about students' ideas and can recognize their value; is attentive to creative "micromoments" in the classroom (Beghetto, 2009), and gives students necessary support and autonomy (Amabile, 1992). We cannot stress enough the importance of teachers' creative attitude. Their actions and attitudes towards creativity may influence what and how students will learn, whether they engage in creative problem solving or not, and whether they feel confident to share creative ideas and other creative behaviors (Piirto, 2010; Runco, 2004; Runco & Bahleda, 1987). Creativity lesson program is not set in stone; every teacher who uses its elements in his or her practice can add new activities and ways to shape creative attitudes. The best way to teach creativity lessons is to be empathetic, authentic, open and assertive, and also creative—flexible, reflective, and innovative (Szmidt, 2001a).

The Course of the Creativity Lesson

Each creativity lesson aims to: *stimulate* abilities and skills relevant to each of the three components of creative attitude; *train and develop* creative thinking skills; *encourage* engagement in creative activities (e.g., innovations); and *help* overcome obstacles (fear, lack of motivation etc., peer pressure).

Creativity lessons typically start with a "divergent thinking warm-up." Students and a teacher sit in a circle, and the teacher starts asking about the students' current mood, their attitude towards the lesson, or about any interesting things that happened during the past week. The goal of the warm-up is twofold. It creates a safe and supportive atmosphere, and it helps the students to focus on tasks and problems they are going to solve during the lesson. The warm-up is also an icebreaker, and as such helps shy students to open-up and lessens the fear of new and unknown experiences. During the warm-up, the teacher may incite the students' curiosity by throwing in an intriguing problem or a bold question, for which finding an answer is not easy and straightforward (for instance, "What are the things we cannot see?" or "If you could change or remove an event from the history, what would it be?").

After the warm-up, the students focus on creative thinking activities—the central and the longest part of the 90-min lesson. These activities are, in fact, open-ended problems that the students solve throughout the remaining lesson period by means of creative thinking techniques based on inquisitive, associative, and transformative thinking (Szmidt, 2008a, 2008b; Szmidt & Bonar, 1998; Szmidt et al., 1996). The choice of particular activities—formulating questions, combining ideas, or transforming them—depends on the specific problem-solving phase the students work within. For example, let us imagine that the problem at hand is to invent a new and useful product that each student can carry in his or her bag. To get the process started, we engage the students in an activity, based on associative thinking called

"Combinations from a bag." We split students in teams of five to six, and ask everybody to take one item out of their bags, and put it on the table. We don't ask them, however, to pull out a random item, but rather one that starts with a given letter (for instance, l for lipstick, p for planner, n for notebook, c for candy, and the like). After the students have arranged the items alphabetically, they are asked to combine two objects together, say the one that starts with "l" with the one that starts with "p"—lipstick and planner—and consider what attributes or functions of a lipstick and planner can be combined to come up with something new and useful. For instance, the combination of lipstick and planner can bring about a "mood of the day" communicator: a smart screen that reacts to the intensity of touch for those who need to communicate their moods and emotions on daily or even hourly basis. Each team generates up to three new and useful objects out of "things from their bags" and presents their inventions in the form of drawings.

During the creativity lesson, the students learn to use specific heuristics suitable for a given problem to be solved. They are engaged in various forms of brainstorming, they learn how to use synectics, and learn how to analyze the value of the solutions. In other words, the students learn how to use particular techniques—like idea combination—in problem-solving situations.

The last part of the 90-min period is devoted to feedback and summary. The students now have the chance to analyze their experiences, emotions, and feelings that have accompanied them throughout the lesson; they also try to extrapolate what they learned in the class to everyday life situations. To facilitate this part of the creative lesson, the teacher encourages the students to finish sentences like: "I learned today that. . ." or "The difficult/easy/funny part was. . ." and the like.

Summer Seminar for Teachers

The Context and Rationale

In the past, the *Special Topics in Arts and Humanities Summer Seminar* for teachers, offered by The University of Texas at Dallas and the Dallas Museum of Art (DMA), focused predominantly on lectures, conversations, and interactive gallery experiences with works of art from particular areas of the DMA's collection. With the opening of the DMA's unique learning environment, Center for Creative Connections (C3), the seminars have been gradually enriched with readings, discussions, and workshops that focused on creativity and the creative process across domains. Over the years, the teachers who have attended the seminars expressed their desire to participate in a more comprehensive series of discussions and workshops that would show them not only how to teach creatively but also —more importantly—how to *teach for creativity* in art, humanities, and other classes. For the 2010 edition of the Summer Seminar, one of the authors and DMA staff decided to offer a week long, intensive program that focused solely on

creative thinking and creative interpretation of works of art. The major goal of 2010 edition of the seminar was to focus on various ways creative thinking tools and activities could be used in the classroom to bridge "the creativity gap" caused by the lack of adequate training of teachers in teaching creativity (Mekel, 2009, p. 39). A year later, we offered a comprehensive, annual seminar on the role of *education for creativity*. The seminar, described herein, included a series of discussions on creativity and education, creative thinking workshops, and experiences with the DMA's collections, and with the Center for Creative Connections—the hub for fostering imagination and experimentation.

We believe that innovative and creative teachers lie at the heart of education for creativity. Thus, the major motivation behind the Summer Seminar is to raise awareness among teachers about the value of developing their own creative attitudes and skills, and enhancing their teaching skills, which in turn may be invaluable in nurturing students' creative attitudes, curiosity, and creative thinking. This is consistent with *the rule of teacher's creativeness* described earlier (Szmidt, 2001a), which suggests that developing creative attitude depends on teachers' actions and may depend on their own attitudes towards creativity. Numerous studies demonstrate that whether negative or positive, teachers' attitudes towards creativity may influence instruction by using (or not) problems or questions that encourage creative thinking, curiosity, intrinsic motivation, and creative action or behavior (Beghetto, 2007; Bonar, 2008; Craft, 2000; Cropley, 2001; Klus-Stańska, 2000; Starko, 2010; Jeffrey & Woods, 2003).

As we pointed out earlier, shaping creative attitude is not an easy task. Changes in attitudes are subtle, do not appear right away (cf. Olson & Zanna, 1993), and require an investment of time and enormous effort on the part of the teacher. And there is the danger of aborting the process, as there is no "easy fix" for attitudes that are not desired (see Wiśniewska & Karwowski, 2007 for a review of training effectiveness). With that in mind, one of the authors and the DMA staff have decided that the completion of the week long seminar is not the end of our engagement with teachers' and their students' development. Hence, we have created various opportunities for teachers to continue the conversation on education for creativity, such as mentoring, coaching, monthly electronic forums/blogs, post-seminar meetings, and building an archive of creativity lessons across all subjects taught at school. The Seminar's alumni contribute to the archive with the lessons they designed and implemented; each lesson encompasses elements of shaping creative attitudes as well as creative thinking skills. (We present one such lesson at the end of this section.)

Some questions that the Summer Seminar curriculum may raise are why the art museum as the venue for the Seminar? And—why education through art? First of all, the Dallas Museum of Art is not just your typical art museum, to which a visitor comes to passively view works of art. Quite the contrary. For starters, DMA houses The Center for Creative Connections, a unique learning environment that provides interactive encounters with original works of art and artists for visitors of all ages. C3 is intended to stimulate curiosity, inquiry, reflection, and creativity in visitors of all ages as they connect more deeply with works of art, and as they transfer that

experience to their everyday and professional lives (Pitman & Hirzy, 2011). In fact, what is intended to happen at C3 spills over to almost every educational program at DMA, for teachers or a general audience. Secondly, The DMA is committed to learning more about its teacher audience and how they teach (Randi Korn & Associates; see: http://www.dm-art.org/idc/groups/public/documents/web_content/dma_215747.pdf).

The answer to the second question is more complex. There is mounting evidence that *learning through art* provides an opportunity for students to develop problem-solving skills and creativity (Sawyer, 2012). For example, a 4-year research initiative at the Guggenheim evaluated the impact of its pioneering arts education program Learning Through Art (LTA) on students' creative thinking and problem-solving abilities. It demonstrated that arts education helps to develop the skills necessary for successful and effective problem solving (Learning Through Art; see: http://www.guggenheim.org/new-york/press-room/releases/3400-aps-release). Similar conclusions have been drawn from Howard Gardner's *Project Zero* (as cited in Sawyer, 2012) and other related research and educational initiatives (see Burnaford, 2007). Education through art seems to nurture unique *habits of mind*—the dispositions to observe, envision, express, reflect, stretch and explore, engage and persist, develop craft, and understand the art world (Eisner, 2002; Hetland, Winner, Veenema, & Sheridan, 2007 as cited in Sawyer, 2012; Starko, 2010). It is also proposed that when art is integrated with learning other content areas, the acquisition of new knowledge is more effective (Dewey, 1934; Khatena & Khatena, 1999; Piirto, 2004; Sawyer, 2012).

However, other researchers state that it is hard to support the claims that learning through art enhances general cognitive skills or that the learned skills from one domain can be transferred to another domain (Burnaford, 2007). It may be true, if we assume that creativity is content specific; art, after all, may require a different and unique skillset than mathematics does. Without going deeper into the content-specificity or content-generality argument, and in line with the aforementioned definition of creativity, we assume that, yes, the particular skills may be different and specific, but the creative process has some general characteristics that can be seen across domains (Plucker et al., 2004; Weisberg, 2006).

To sum up, the major rationale for the Summer Seminar for Teachers is to provide an intensive and comprehensive training in *teaching for creativity* for teachers who teach at various levels of education and in various domains. Increasing teachers' competency in creativity and creative thinking enables us to reach a greater number of students; teaching for creativity is not then an "event" driven effort (weekend classes; summer camp), but a systematic effort during each lesson throughout a school year. And finally, we believe that showing the parallels between the creative process in arts and other domains enriches the learning process and educates "flexible thinkers" who are able to use knowledge, experiences, and ideas from different domains (Plucker et al., 2004).

The Goals of the Summer Seminar

The Summer Seminar curriculum aims to achieve the following specific goals:

- To understand the role of creative attitude in teaching for creativity
- To learn how to train creative thinking skills
- To learn about creative process through works of art
- To learn how to use creative problem solving to design a creativity lesson

The first goal is linked to debunking some of the most prevalent myths about creativity (Plucker et al., 2004; Plucker & Dow, 2010). To this end teachers discuss their own beliefs about creativity and read assigned material with up-to-date findings in psychology and education (Beghetto & Kaufman, 2010) to confront the misconceptions with existing evidence. The discussion focuses also on how those myths affect attitude towards creativity and how that in turn affects students.

To reach the second goal, the teachers are engaged in the workshops in creative thinking techniques that, we believe, can be applied across domains. These techniques belong to three general categories: inquisitive thinking (e.g., generating questions, active and close observation, speculations); combinatorial thinking (e.g., associations, analogies, metaphors); and transformative thinking (product/idea improvement, transforming one object into another, etc.; Szmidt, 2008a, 2008b). Teachers learn how these techniques can be trained and how to incorporate them into various existing curricula to develop students' creative thinking skills not only in arts and humanities but also in social studies and the sciences, as well.

The gallery experience component helps to attain the third goal. Through activities in the galleries, teachers have the opportunity to envision the creative thinking process behind given works of art and make parallels between these processes and "how thinking should be done" in their respective domains. The galleries serve also as our "laboratory" space, where teachers can combine a particular set of techniques with a given challenge that involves a given work of art. For instance, once we know what inquisitive thinking is and techniques through which it can be trained, we invite teachers to spend some time with a given piece of art, observe it closely, and write down any questions (about facts, about a cause, hypothetical, and speculative) it evokes, and any detail they can see. By the same token, once teachers know what combinatorial thinking is all about and how to form different types of associations and analogies, they have a chance to apply these skills in an interpretive play, an activity during which everybody is asked to share any associations, analogies, or metaphors they have in response to a painting, sculpture, or installation.

During the seminar teachers learn how to use the Creative Problem Solving (CPS) method proposed by Isaksen, Dorval and Treffinger (1994) to help meet the fourth goal. To experience CPS in action, teachers use heuristics and a guide to design a lesson that combines creative thinking and learning through art to shape creative attitude and teach a given topic.

The Course of the Summer Seminar

The content of the Summer Seminar is divided into three sections—each section is devoted to one of the three categories of creative thinking techniques mentioned above: *Nurturing Inquisitive Minds*, *Nurturing Associative Minds*, *Nurturing Transformative Minds*. Each section starts with a short discussion related to the major theme and with an intellectual warm-up, which helps to set the tone and atmosphere and to introduce the creative thinking techniques to be learned. For example, the section on *Nurturing Associative Minds* starts with a short discussion about the role of associations in art, in scientific discoveries and in business. During the warm-up, teachers are asked to come up with different associations to a given prompt and to build the shortest and the longest chains of associations between two unrelated words. Their attention is drawn to types of associations and their different functions in the creative process: to combine ideas and to describe ideas (Boden, 2010; Nęcka, Orzechowski, Słabosz, & Szymura, 2008).

The discussion and the warm-up are followed with the creative thinking session, during which teachers learn how to use particular creative thinking techniques on their own and in problem-solving situations. One of the techniques teachers learn to use during the Nurturing Associative Minds section is call Pyramid of Associations, developed by Janusz Kujawski (see Szmidt, 2008a, 2008b). This activity can be used in many different ways: to write stories, to understand topics/problems, or to analyze a character from a novel. The technique is based on forming short chains of associations. We start with writing down associations to a given object/character/problem. Then we choose between six and eight associations that will form the pyramid's base. These words need to be written one next to another at the bottom of a large piece of paper. The next step is to find an association to the words, starting from the left hand side, 1 and 2, then 2 and 3, 3 and 4, 4 and 5, and so on. We then move to the next level, associating neighboring words again, and so on until we reach the top of the pyramid—that is one association. Ideally, this association should incorporate the meanings of all the words used to build the pyramid and should be the essence of the object/phenomenon we try to describe and understand.

Later in the galleries, teachers apply creative thinking skills they have learned to tasks based on the artistic process and/or works of art. In the case of *Nurturing Associative Minds*, the task is to master combinatorial thinking through *Interpretive play* (Burnham & Kai-Kee, 2011), an activity that makes works of art come alive. In this activity, the participants are encouraged to generate numerous interpretations about a given piece of art. The goal is to share deep, affective experiences through associations and metaphors, and to keep the interpretations open.

This section is concluded with a reflection period, during which teachers discuss their experiences and also ideas for lessons they are asked to design. It is also a quiet time—time to think and reflect, time to stroll through the galleries, and time to jot down some notes about ideas that the content of the section has inspired.

The Results: A Lesson Designed and Tested During the 2011 Summer Seminar

One of the teachers who participated in the 2011 edition of the Summer Seminar designed an art lesson that would promote autonomy and help her students to overcome some barriers in the creative process: perfectionism, fear of the unknown, and premature closure. The barriers, she confessed, stemmed, most likely, from rigorous pedagogical practices applied in the school (a private school in the Dallas area): students have to follow detailed and specific guidelines in how to learn, how to take notes, and how to behave during classes. One of the consequences, according to the teacher, was that during the art classes students were too afraid to make mistakes, for instance to draw the line without the ruler. Also, according to the teacher, they had a tendency to either settle on the very first idea they had or stop the activity when they would make the first mistake. The materials she used were a large piece of butcher paper—big enough for a group of eight participants to surround it—thick, black Sharpie markers, and pastels. Without giving thorough instructions, she called out: "Draw a line and shift the seats to the left!" At each rotation, someone else from our group gave an instruction to draw a shape, an angle, etc. The drawing process continued until all of us were back at our starting points. The next step was the coloring process. We used soft pastels to color the area nearest to each of us. We were told that we could blend the colors or leave them pure, and that leaving white space was OK too. Finally, when we thought we finished our collective drawing, the teacher asked us to grab the paper and tear it! We finished by mounting the drawing on the wall and forming it into a relief piece. Our artwork symbolized making the mistake and using it to improve the product (see Fig. 2.2).

At the Heart of Education for Creativity

In the previous paragraphs we have discussed the role of creativity and creative attitude in education; we described two successful programs that aim to shape and foster creative attitudes and creativity: the Creativity Lesson program and the Summer Seminar for teachers. However, there is one central and absolutely necessary factor in teaching for creativity that we cannot stress enough: a creativity teacher. We said earlier that the creativity teacher does not need to be an artist, performer, inventor or researcher (although the latter may be helpful at times). Her creativity, though, needs to center on innovative instruction that fosters weariless curiosity, bold ideas, and independence of thought. The creativity teacher needs to be a kind and resourceful observer of her students' unfolding creative potential so that she can identify it in the micromoments of the classroom (Beghetto, 2009) and stimulate it through engaging the students in meaningful and captivating tasks. Still this is not all that the creativity teacher has to do (or has to become). The creative teacher needs to have a positive attitude toward creativity herself and accept the

Fig. 2.2 From abstract drawing a to relief: Overcoming barriers in creative thinking. Activity presented during 2011 Summer Seminar for teachers. Dallas Museum of Art, UT Dallas, TX, June 14–17, 2011

changes in the instructor's traditional role. Following Starko's (2010) suggestions, the creativity teacher must:

- Change from someone who gives the packaged and fully processed knowledge to someone who seeks interesting problems to solve; who is a coach or trainer, spectator, and even—a publisher of his students' work.
- Be responsible not only for teaching required content and skills but also for presenting problems and questions to which he doesn't know the answer yet, so they can find the solutions, ideas and answers together.
- Help students find or formulate ideas that are worth sharing, as well as nurture an audience who would like to hear about those ideas.

Accepting these changes is not easy and it does not happen overnight (or even after a couple of training sessions), but it is definitely worth the effort as the teachers who attended the Summer Seminar and the Creativity Lesson program tell us. Our students' creativity flourishes only where the teacher notices it, values it, and nurtures it—and this is what lies at the heart of education for creativity.

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Chapter 3
The Art in Action Project

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Art in Action is a federally funded grant, designed to integrate the arts with math and reading instruction for elementary schools. Gazzaniga (2008) presents evidence connecting student learning in the arts to academic achievement in other subjects including math and reading. Three schools were chosen to participate in this four-year project, which pairs teaching artists with classroom teachers to creatively design and deliver arts infused
(continued)

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instruction along with appropriate technologies. Trainings for teachers and artists include a graduate level course and multiple workshops and retreats. They are encouraged to work together to share their expertise in standards-based instruction and to infuse arts and core subjects together in unconventional ways. Consequently, the goals are to encourage both constructivist pedagogy and to increase the 21st century skills of collaboration, creativity and critical thinking. The evaluation team is looking at student achievement scores in math and reading, teacher and artist attitudes as they reflect on instruction, and changes in the way classroom teachers deliver instruction over time.

A New Model for Twenty-First Century Learning

Scientific inquiry is changing the status of the arts within the academic structure by confirming that arts training improves cognition by strengthening children's ability to focus. In 2004, The Dana Foundation initiated a series of studies to examine how arts training is associated with higher academic performance (Gazzaniga, 2008). They found that an interest in the arts is linked to motivation which sustains attention leading to improved cognition (Gazzaniga). This and other studies document the mental discipline, social competencies, personal dispositions, and mastery of academic subjects inherent in arts learning, which forms the basis for the AIA project model design (Fiske, 1999; Hyatt, 2010; Rich, 2005; Stevenson, & Deasy, 2005).

AIA is a partnership between ArtsErie, four elementary schools: Union City, Second District (2010/2011 School Year), First District (2011/2012 School Year to present), and Cambridge Springs, and Edinboro University of Pennsylvania. This 4-year project integrates dance, music, visual arts, and drama into math and reading curriculum to enhance the quality of classroom teaching and student academic achievement and engagement in the learning process. The AIA goals are (1) improve teachers' ability to implement an arts integration model in their instruction through participating in faculty development and collaborative artist residencies and employing the art-making process in a constructivist approach to teaching and learning and (2) improve student achievement in math and reading, student engagement in the learning process, and student learning habits associated with the arts through participating in arts-infused lessons.

AIA also draws on the working model of training successful professional artists to take the processes and products of their art into the community, including public and private schools. Eric Booth, a leading teaching artist and trainer, defines a teaching artist as "a practicing professional artist with complementary skills and sensibilities of an educator, who engages people in learning experiences in, through, and about the arts" (Arizona Commission on the Arts, 2011). Approximately 25 teaching artists representing each of the four major art disciplines—music,

drama, dance, and visual art—have been preselected from the Pennsylvania Council on the Arts Teaching Artist Roster for this project, through which they engage 900 students annually in arts-infused classroom-based learning.

AIA uses these teaching artists because contemporary research has identified connections between learning through the arts and student growth in academics, cognitive skills, and social development (Fiske, 1999; Hyatt, 2010; Stevenson, & Deasy, 2005). The study of each art form leads to different behavioral and cognitive advancements. As Gazzaniga (2008) reported:

- An interest in performing arts leads to a high state of motivation that produces the sustained attention necessary to improve performance and the training of attention that leads to improvement in other domains of cognition.
- Specific links exist between high levels of music training and the ability to manipulate information in both working and long-term memory; these links extend beyond the domain of music training.
- Training in acting appears to lead to memory improvement through learning general skills for manipulating semantic information.
- Learning to dance by effective observation is closely related to learning by physical practice, both in achievement level and neural substrates that support the organization of complex actions. Effective observational learning may transfer to other cognitive skills.

What is the impact on teachers of arts integration in classroom instruction? These AIA artist residencies are also opportunities for teaching artist–teacher collaboration in arts-based instructional design. Improved lesson planning will lead to more active and engaging styles of teaching, and as the arts become a natural part of the classroom, students and teachers benefit. Stevenson and Deasy (2005) concluded that as educators improved their capacity to integrate the arts, they began to feel higher levels of satisfaction in the classroom. As teachers and artists work together to foster a supportive learning environment, positive changes in student behavior and academic achievement validate their efforts to broaden and strengthen their teaching styles leading to a greater sense of accomplishment (Rich, 2005).

The evaluation plan for Art in Action was developed based on a logic model that recognizes the power of these artist–teacher teams and arts-infused instructional methods to improve the effectiveness of classroom instruction. During each of the project's four years, the evaluation examines outcomes that measure teaching quality, in addition to instructional impact on student achievement and engagement. Data collected is specific to each residency in each classroom and includes both participating and nonparticipating classrooms based on random assignment. The research design is discussed further in Appendix A. Part of the design is collecting reflective open-ended responses from teachers and artists after the residency which provide powerful insights on its impact. For example, one teacher noted:

> The majority of my students can remember and re "act" the story that was told.. . .Some are even improvising. But the biggest thing is how they carry it over to their regular day. Today at recess five of my students were very involved in an imaginary play and interacting with each other. One was a lion who was sneaking around, and finding the people. To most

> people, that doesn't seem like much, but usually my students don't engage in play with each other, and their imagination isn't very creative. They are also doing very well with their language and communication skills. (Walker, 2011)

Educators would also affirm that the pedagogy cultivating such achievements needs a foundational theoretical framework. For the AIA goals, this framework is constructivism.

This pedagogical perspective values learning through experience, the capacity to reflect on experience, and the ability to connect one experience to another (Dewey, 1938). Experience, reflection, and connection must become habits of mind for students to succeed in the realm of twenty-first century learning which requires facility in critical thinking and problem solving, communication, collaboration and creativity (Bruner, 1973; Hyatt, 1999; Partnership for 21st Century Skills, 2010).

Psychologist Jerome Bruner (1973) argued for a pedagogy grounded in discovery learning and understanding mind as a creator of meanings. He posed this question:

> It is my hunch that it is only through the exercise of problem solving and the effort of discovery that one learns the working heuristic of discovery: and, the more one has practice, the more likely is one to generalize what one has learned into a style of problem solving or inquiry that serves for any kind of task one may encounter—or almost any kind of task. Practice in inquiry, in trying to figure out things for oneself is indeed what is needed, but in what form? (p. 412)

The challenge becomes searching for an answer to Bruner's question. *American pragmatist humanism,* defined in terms of Peirce's pragmatic theory of meaning in which "the function of belief, is to establish the habits of action" (James, 1890/1983, p. xvi), James' pragmatic theory of truth of an individual, and Dewey's pragmatic theory of education as "a deliberately conducted practice" (Dewey, 1916, p. 38), offers an answer: a theory of knowledge that values human enterprise and emphasizes both creative power and the need for verification in experience (Dewey, 1938; Hyatt, 1999). "Learning by doing" was formalized by John Dewey (1897) as he argued that meaningful learning experience is grounded in "doing" and then "critically reflecting" on what was done by first noticing through the senses and then making judgments on what was noticed. The nature of such an inquiry encourages learning to be owned rather than received and meaning to be discovered and made rather than mandated.

Maxine Greene (1978) argues that organismic processes like art making offer conditions that serve acknowledgment, reflection on, and response to vividly felt personal and intrapersonal experience. Enter the realm of emotion, followed by the clear understanding that the arts infuse content with feeling, which, according to neuroscientist Antonio Damasio (1999), is just as cognitive as any other perception. Joan Erickson (1988) has observed that genuine creative work requires reflection on experiences validated by trustworthy senses and that the struggle to maintain fidelity to our senses is particularly significant since traditionally our schooling has neither emphasized nor promoted such confrontation and/or consideration.

So if constructivism is the pedagogy of experience, reflection, and connection and we acknowledge that feelings play a critical role in reflection, then constructivism is a pedagogy that engages the whole child. It seems reasonable to suggest that when applied to arts-infused learning, constructivism is the practice in inquiry that responds to Jerome Bruner's 1973 insight and question. AIA will demonstrate how this constructivist approach transforms and empowers educators.

Empowering Teaching Artists and Classroom Teachers as Cocreators of Learning

In Pennsylvania, home state of the AIA project, artists are juried and rostered as members of the state Arts-In-Education Directory. Because of this, schools who host a residency with a rostered artist can expect a high level of artistic excellence from the teaching artist with whom they choose to partner. The Pennsylvania Council on the Arts (PCA) defines effective practice as follows:

> Residencies include substantial periods of time in which the artist works intensively with small groups of students ("core groups") on. . .long-term projects. During this time, students should exercise creative control over their work. The artist's role in such work should be that of mentor and facilitator, and technical adviser on necessary skills (PA Council on the Arts, 2011, p. 5).

A PCA residency features teachers teaching artists and students creating through a particular art form, with an emphasis on a culminating event; i.e., deep learning *in the arts*. This type of residency program produces many transformational experiences for children. However, emerging research in theories of learning supports going beyond the scope of a traditional residency (working toward a product) to bringing the arts into education in a multidisciplinary fashion (working through a process) (Stevens, 2000). In AIA, teaching artists are to become critical partners with classroom teachers, so the teachers may learn to identify and employ the process of art making within a constructivist approach. In turn, mentorship and professional development empowers the teaching artist in effective practice of arts integration where learning happens *through* the arts. Juliano and colleagues (2002) explored models of arts integration and arts infusion, articulating how the arts make connections to other disciplines and lead students to deep understanding. This work defined arts integration as, "Interdisciplinary education enabling students to identify and apply authentic connections between two or more disciplines and/or to understand essential concepts that transcend individual disciplines" (Juliano et al., p. 3).

Of special interest is their discussion of arts infusion as "rare and sophisticated" with a relationship that is "integral to both" in teaching for understanding rather than simply rote knowledge (Juliano et al., 2002, p. 9). Emerging research also supports the crucial role arts integration may play (Arts Education Partnership, 2002, Burnaford, Brown, Doherty, & McLaughlin, 2007; Luftig, 2000). Dr. Victoria Stevens (2000), a noted clinical psychologist and arts educator researching brain development, arts and learning, wrote:

> In other words, just listening to Mozart for example, will in all probability not increase memory or visual-spatial skills. However, it can, if taught with an eye toward metaphor, analogy and problem-solving, and within the already existing curriculum. What I am suggesting is a new way of teaching which emphasizes connections, links and patterns within disciplines and which includes the arts. (pp. 23–24)

Her work is borne out by the findings of the Perpich Center for Arts Education, whose manual for arts integration produced in conjunction with a ten-year project in the Minneapolis public schools, finds a clear connection between measurable growth in teaching and learning if the teacher and the teaching artist collaborate to "create a culture in which students develop useful habits of mind, teacher and artist collaboratively expose the thinking and interacting behaviors that occur in many disciplines" (Thompson, Barniskis, & Aronson, 2005, p 23).

This collaboration enables student understanding of concepts that transcend and integrate individual disciplines. If effective practice in arts integration/arts infusion requires finding these intersections, then what emerges is a need for a common language between artist and teacher for planning instruction.

To this end, AIA created a series of specialized professional development for teaching artists informed by standards-based instructional techniques and the concepts of "Understanding by Design" (Wiggins & McTighe, 2005) to build a common language between teachers and artists. Classroom art teachers also participate in the trainings and often serve as building champions who utilize their familiarity with the students along with their teaching and artistic knowledge to assist in residency planning and implementation. In addition, four Art Specialists experienced as arts teachers and practicing artists help bridge the worlds of artist and classroom teacher by mentoring the teaching artist during their residency to provide embedded professional development. Three components of these trainings emerged as integral to success:

- Supporting the artist's understanding of state standards for curriculum planning and instruction.
- Modeling arts instruction with a focus on inquiry and a constructivist approach to learning.
- Facilitating clear communication between the teaching artist and educator by providing ongoing mentorship during the artist's residency.

These professional development experiences include three day Learning Laboratory retreats where the artists are introduced to state standards for Arts Education, experience arts integrated instruction in language arts and mathematics in the role of student, and work with a curriculum planning template using classroom scenarios and sample curriculum. Then the teaching artist, classroom teacher and often the classroom art teachers for each partner school conduct joint planning meetings using a template based on identifying big ideas and concepts common to arts and reading or math. Arts Specialists combine site visits, individual trainings, and distance learning tools to mentor teaching artists and facilitate their team-teaching experiences with their classroom teacher.

A cadre of trained teaching artists has emerged who understands the needs of the classroom teacher, their role as critical partner, and the power of the art making process to engage children in deep learning that transcends subject matter. A sixth grade teacher tells of one child's progress in this transformational learning:

> One. . .learning support child at the beginning of the year did not put a lot of detail in his work. This little boy was able to write a paragraph, support his point of view with evidence from the story and include a lot of detail. I showed this to the little boy's mother when she came in for an IEP meeting and she started to cry ("First District Drama," 2012).

And a teaching artist mentions student engagement:

> I think the power of using video in a kindergarten classroom has to do with using the child's image. . .Kids this age love to see themselves on camera.. . ..If, with their image, comes a lesson, the child will re-engage in that lesson as many times as they watch their video (First District Drama, 2011)

It is clear that effective practice in arts infusion requires finding the intersection between arts processes and habits of learning and building collaboration between the artist as teacher and the teacher as artist. The AIA model of supporting artists using professional development and mentorship, teaching artists a shared language of standards based lesson planning, and modeling a constructivist approach that emphasizes inquiry and meaning making, is vital to transformative learning as evidenced by quantitative and qualitative data on student engagement and growth.

Classroom teachers participate, learn, and collaborate with the teaching artists during these professional development sessions. The most extensive part of the training is a three-credit graduate course offered annually for teachers and teaching artists. Its focus is the integration of music, visual arts and fine art, theater, and dance into the reading and mathematics curriculum.

During the course, teachers and artists experience hands-on activities using big ideas and essential questions in reading, math, and the arts to deepen interdisciplinary understanding. For example, in a geometry lesson, participants move creatively to jazz by eights. At the end of eight beats, they create a geometric shape or line structure and freeze for the subsequent eight beats. (Shapes and line structures for third grade math include squares, parallelograms, and ovals; parallel and intersecting lines; and acute and obtuse angles.) Teachers and artists work together to create body art to demonstrate math concepts. Their artistic strategy in demonstrating their shape, line or angle, can then be transferred to students during math class. With these activities a third-grade teacher can deepen student understanding of the math concepts while allowing for individual differences, collaboration, and aesthetic sensitivity to music and movement. Other hands-on opportunities include retelling children's stories through music and dance, and employing fine art, appropriate objects, and background music to enrich the reading of a book. Then classroom teachers and artists examine the Academic Standards in Mathematics, Reading, and the Arts and Humanities and develop instructional unit plans that integrate the arts into the core academic subjects. Classroom teacher and teaching artist partnerships broaden pedagogical perspectives. The teachers try

more active, hands-on and artistic strategies to teach content and the artists learn about standard-based learning, assessment, and backward planning techniques.

These arts-infused unit plans are then taught in the classrooms. Examples include:

- Reenacting a story that occurred during the Depression Era using simple props and costuming, video recording the performance and showing it at a local theater (characterization and setting grade 6).
- Using silent sustained movement to retell the story *Goodnight Moon* (Brown, 1947) to Debussy's *Claire de Lune* (1890–1905) and examining ten pieces of fine art to determine which ones best capture the mood and flow of the story (sequencing grade K).
- Discussing the factors that lead to a product of 12, and then creating their own 12 beat rhythm block pattern, performing it for the class, and comparing it to African polyrhythmic patterns (multiplication for grade 4).

Clearly, the teachers, artists and their students are challenged to think "outside the box" and perform, create, and be unique in their curricular approaches to thinking and learning. This 21st century educational model requires this co-creating attitude in the classroom. These experiences can be expanded through technological tools in creative teaching and learning.

According to Lowenfeld and Brittain (1987), creative teaching and learning environments are influenced by specific conditions and environmental factors including the choice of materials and the psychological climate. In the AIA program, teaching creativity and teaching creatively happen when trust in the co-creating process allows students, teachers, and teaching artists to collaborate, challenge, and redefine learning in new contexts. The expectations for the children's creative behaviors are the same for the teachers leading them (Lowenfeld & Brittain).

Creative teachers and teaching artists understand that trustful, creative experiences with their students influences their students' natural curiosity, discovery, level of self-actualization, motivation, and creative inquiry (Lowenfeld & Brittain, 1987; Mulcahey, 2009). Because creative thinking involves a fluency factor (the ability to produce many ideas), and a flexibility factor (the ability to shift easily between different kinds of thinking), this is also important to consider in creative teaching (Lowenfeld & Brittain). Successful arts-infused instruction includes the elements Lowenfeld and Brittain had described as, "originality, elaborative thinking, risk taking, complexity, curiosity, and imagination" (p. 86) which are essential in creative teaching.

This creativity wouldn't exist without the foundational skills embedded in arts education, supported through the use of appropriate educational technologies. Therefore, the AIA model of teaching these creative capacities involves students in dynamic activities and processes through arts and technology infusion. There has been much research in arts infusion, multimodal literacies and academic achievement, essential to the AIA program (Arts Education Partnership, 2002; Burnaford et al., 2007; Luftig, 2000; Rabkin & Redmond, 2004; Sanders & Albers, 2010). This

is particularly the case in the residency work where arts and technology experiences are infused with appropriate math and reading learning skills.

According to Lee Schulman's PCK (pedagogical and content knowledge) model, arts content knowledge has a dynamic relationship with pedagogy, as content and pedagogy are not separate enterprises. Koehler and Mishra (2008) later added "technological" to the PCK model, which resulted in TPCK, now known as TPACK, or technological pedagogical content knowledge that explores new dynamics created through the overlap of technologies, teaching, and arts content. This is an important model to consider when planning instructional content that includes technology in arts-infused residencies useful in creative approaches to teaching (Dempsey, Harris, & Hofer, 2012 and DePlatchett, 2001). Although there are several articles, book chapters, proceedings, and a taxonomy related to the arts and TPACK, literature in the area of K-12 arts infusion and TPACK is not available (Bauer, 2010, 2010a; Dempsey, Harris, & Hofer, 2012; Dempsey & Mroziak, 2011; Harris, Mishra, & Koehler, 2009; Koehler & Mishra, 2008 and Mroziak & Bowman, 2011).

There are numerous examples of how technology infusion and the TPACK model were evidenced in AIA residency work. For example, in a visual arts residency, one of the teaching artists included video and photographic documentation on the project wiki (Union City Visual Arts, 2011). The embedded exemplars combine technological, pedagogical, and arts content knowledge in practice. This residency included creative intersections between teaching, technology, and visual arts content through life skills and second grade classes. As evidenced in documentation, examples included stop animation, storyboarding, illustration, 3-D mixed media constructions and video production to address reading fluency and a mastery of math facts.

In a theater residency teaching artists worked with sixth grade and kindergarten classes around math and reading skills and drama areas ("First District Drama," 2011). The work included media literacy and digital storytelling elements combined with letter and number recognition, as well as vocabulary and counting skills in kindergarten. Tools such as Comic Life, iMovie, MovieMaker, iStopMotion and SAM Animation were combined with process elements relating to stop animation, film, video editing and student performances.

In both examples, elements of teaching creatively can be seen in the process of self-discovery, flexibility, and adaptability for the students, teachers, and teaching artists. Considering the Partnership for 21st Century skills report, *Learning for the 21st Century* and the 21st century skills map for the arts (2010), arts infusion experiences can be catalysts for self-discovery, creativity, and critical thinking and an important content area when combined with TPACK (Dempsey, Harris & Hofer, 2012; DePlatchett, 2001). The Partnership for 21st Century skills map for the arts also ties together arts-based learning outcomes to the thirteen habits referred to as 21st century skills which include collaboration, creativity, critical thinking, adaptability, information literacy, initiative, innovation/communication/technology literacy, interdisciplinary themes, leadership, media literacy, accountability, and cross-cultural skills.

New dynamics in teaching and learning are created when arts experiences in drama, dance, music, and visual arts are combined with educational technologies

and other content areas, and if appropriately infused, it can be hard to distinguish where the residency mediums deal specifically with either a technology or an arts modality. What is clear is that when 21st century skills and creativity are considered, a one-size fits all model of TPACK would not be effective in the arts, as arts and technology learning by nature are divergent (DePlatchett, 2001). This is the case in the AIA residency work, as the technologies employed could be seen as educational support tools in creative teaching, while also serving as creative media for arts learning. In some of the residency examples, the line is blurred between what constitutes a 21st century technology as a support tool versus a creative arts tool. This is appropriate when considering the Partnership for 21st Century Skills (2010) definition for creativity that includes, "demonstrating originality and inventiveness in work" and "being open and responsive to new and diverse perspectives" (p. 6). The AIA program is a model to see concrete examples of how this definition of creativity can be combined with 21st century skills in arts and technology infused with math and reading skills.

Challenges remain. The AIA planning team's assumptions that teaching artists understood curriculum and standards and classroom teachers understood arts-infused teaching were unfounded. Both groups of educators also needed training in collaborative teaching. The AIA planning team is learning to more quickly identify and meet the needs of educators involved in the project.

Both classroom teachers and teaching artists have been slow to adopt this new model. Teaching artists are challenged to rethink art and teaching, and realize that their art form has to be relevant and applicable to curriculum and not exist as art for art's sake. Classroom teachers are asked to overcome their reluctance to commit to the extra time and training demanded by the project as well as to classroom observations and evaluations by "outside" professionals. Scheduling difficulties and the emphasis on testing and the preparation it demands further strains teacher's commitment to project goals.

In closing, the AIA project is serving teachers, resident artists and most importantly, many students develop new ways of thinking and learning. Results are encouraging news to advocates of arts-in-education.

> The excitement and energy created using this approach is beyond anything I ever thought possible. . .I have been introduced to an extremely powerful teaching tool and have seen first-hand the benefits through this [artist residency] experience.
>
> Unsolicited communication from first grade teacher Rebecca Leandro

Measuring Success: Art in Action Evaluation Methods and Mid-Project Results

While the evaluation of Art in Action primarily assesses the outcomes for the key participants of this program (i.e., teachers, artists, and students), it also examines the program's implementation and in real time, provides feedback to the program development team for continuous improvement. Thus, this effort can be considered a developmental evaluation (Patton, 2011) and through collaboration between

evaluators and implementers, is utilization focused. The evaluation team is an active member of the AIA program development team, with the role of grounding its work, providing evaluative questions and thinking, and real-time data to facilitate evidence-driven program development decisions that support the AIA goals.

The program evaluation plan is based on a logic model that recognizes the power of arts-infused instructional methods and teacher–artist teams to boost teaching quality in the classroom and student academic achievement and engagement in the learning process (Miller, Bogatova, & Carnohan, 2011). The program outcomes consist of improving five core factors: quality of teaching, student academic achievement in math and reading, student engagement, and key student-learning habits associated with the arts. The overall quality of the implementation of the Art in Action program is assessed as well. Because data collection over the four years is specific to each artist residency with a classroom teacher, and data collection includes both participating and control classrooms, the program development team is able to implement data-informed program changes in order to achieve program intended outcomes.

The following assessment tools were developed to measure the Art in Action factors: teacher and artist observation tool, teacher interview form, teacher and artist attitude surveys, student learning habits inventory, lesson plan checklist and assessment rubric, and program implementation qualitative feedback form.

The quality of teaching is assessed through classroom observation in which a field worker assesses implementation of an art-infused lesson in math or reading and teacher instructional behavior during that lesson, concluding with an open-ended interview with the teacher. The observation for each residency is completed three times during a semester: prior to the residency, during the residency, and in the quarter after the residency has been completed. At the same time, a program fidelity assessment is made to insure that key program components, such as teacher–artist collaboration, art infused math or reading lesson plans, and corresponding art infused lessons take place during teaching artist residencies. Lesson plans are evaluated after each observation through a checklist and lesson plan rubric. Student engagement is also recorded by the field worker during each observation. Key learning habits are assessed prior to and after the residency via an assessment of student cognitive, social, and personal development (Horowitz, R., n.d.). This assessment is completed one to two weeks prior to the residency and then in collaboration with the artist once the residency has concluded. A teacher/artist attitude survey (Horowitz) and a program implementation qualitative feedback form are used to assess the attitudes about the program and for program implementers to provide feedback on areas of improvement. Finally, Pennsylvania System of School Assessment (PSSA) in math and reading and school report card grades are used to assess student achievement in 3rd through 6th grades annually.

Because of the developmental framework of the evaluation, data is continuously collected and analyzed throughout the program for implementation feedback to the advisory team. At the time of this publication, 31 classrooms have had residencies participating in the evaluation. Ten classrooms were from the pilot semester and 21 from the school year 2011/2012. Keystone collected PSSA scores for one-third

grade class of 15 students from the pilot semester. Out of those 15 students, 12 demonstrated proficiency in mathematics and 10 demonstrated proficiency in reading. Pre-residency and post-residency math report card grades were collected from a second grade classroom ($n = 13$) and a third grade classroom ($n = 22$). Four students showed improvement in math report card grades after experiencing the residency. Pre-residency and post-residency reading report card grades were collected from a first grade ($n = 16$), second grade ($n = 13$), and third grade ($n = 15$) classroom. 17 students showed improvement in reading report card grades after experiencing the residency.

As for the classroom measures, a target of 70 % of classrooms showing improvement was determined by the advisory team. All targets have met or exceeded 70 % target except the Assessment of Student Cognitive, Social, and Personal Development. During the pilot only 50 % of the classrooms improved on this measure.

The small number of classrooms that have student achievement data (PSSA and report card grades) does not allow for a clear picture of how this program will affect students. It is a hope of the program development team that lagging measures of student academic achievement will improve with time as the program development team acquires a greater understanding of what works and does not work with respect to implementing art residencies in elementary classrooms.

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Part II
Teaching Creatively

Chapter 4
Cognitive Aspects of Creativity: Science Learning Through Serious Educational Games

Leonard A. Annetta, Shawn Y. Holmes, David Vallett, Matthew Fee, Rebecca Cheng, and Richard Lamb

Introduction

Over $20 billion game industry and just now educators are seeing the benefit if used for good. Although some innovators have been using educational games for some time, it has only been in recent years, Serious Educational Games (Annetta, 2008) have become a highly sought after initiative by both educators and researchers alike. Gaming has conventionally been viewed as a mindless activity engaged in by young men and women during their free time. As a high school teacher in the mid-1990s I had tried to assign homework to my students. When no homework came back or homework came back without much evidence of deep thinking, it was apparent students were engaging in something outside of school much more interesting then what I was proposing for them to spend their time doing. It was the mainstreaming of console game systems-such as Nintendo and Sega Genesis. It was then I knew we had to make that bridge.

Through several years of research and funding, we have begun to develop a framework for fostering creativity in science learning. We did this by allowing students, and in some respects teachers, the ability to create their own games in a three-dimensional environment. We anticipated that creating games would foster a deeper understanding of content. Our data supported this notion (Annetta, 2010; Annetta & Bronack, 2010; Annetta, Folta, & Klesath, 2010; Annetta & Holmes, 2007; Annetta, Holmes, Cheng, & Folta, 2010; Annetta, Lamb, Bowling, & Cheng, 2011; Annetta, Lamb, & Stone, 2010; Annetta, Mangrum, Holmes, Collazo, &

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Cheng, 2009; Annetta, Minogue, Holmes, & Cheng, 2009; Cheng, Annetta, & Folta, 2011; Holmes, Thurmond, Annetta, & Sears, 2012). This chapter will focus on the research and development we have been working on and how it is grounded in learning science, psychology, and cognition.

It is important to first understand how to define Serious Educational Games. Around 2002, the term Serious Games was coined by a group of game developers who were working in training environments (e.g., military, healthcare, etc.). Sawyer and Rejeski (2002) often get credit for this new term. Serious Games were used by the US Department of Defense to train soldiers' skills and techniques before being deployed for conflict. Serious Games afforded soldiers the ability to interact with a wartime environment (created to scale) and to make mistakes (i.e., dying) without experiencing the imminent and terminal consequence. Serious Games also evolved into training protocols for the medical field and its first responders and also for the corporate sector. We wanted to distinguish our work with K-16 educators and students from these other areas and thus coined the phrase Serious Educational Games.

Through National Science Foundation ITEST (Innovative Technology Experiences for Students and Teachers) funding in 2005, the HI FIVES (Highly Interactive Fun Virtual Environments in Science) pilot project became the proof of concept that teachers and students can design and create immersive Serious Educational Games that align with content standards. In HI FIVES, we developed a gaming platform that did not require of any of the knowledge in programming, art, or animation that is needed to develop to commercial game studios. HI FIVES trained teachers on a design process by which they could create activities for their students that they could not replicate in any other way. For example, a teacher created a game about simple machines and had students learn about mechanical advantage by manipulating variables in a game environment. This teacher was from a rural, underserved school system that did not have the money to purchase enough equipment for individual students to tinker with pulleys, screws, inclined planes, etc. Through her game, she found that girls became more engaged with these physics concepts. Beyond the learning however, we as researchers, learned something even more valuable. Students generally thought the teacher games were OK, but that they could have been more fun. To this end, we first asked students how the games could be improved and then taught students how to take the teacher games and improve them through the same design process that we taught the teachers. To our surprise, students became immensely more engaged with the content, learned it at a much deeper level, and used creative aspects through this process that they were not using in their everyday school learning.

These results became a springboard for the currently funded ITEST project and the National Science Foundation project named GRADUATE (Games Requiring Advanced Developmental Understanding Around Technological Endeavors). Ultimately, high school students participated in four phases of learning to fulfill North Carolina public school's graduation requirements set forth by the North Carolina Department of Public Instruction. These four phases included actively participating in scientific research, writing a research paper to disseminate student findings,

constructing a Serious Educational Game, and presenting the findings to a panel of experts. The creative aspects of Serious Educational Game development entailed using individual student research findings to create a game that ultimately would be used by teachers throughout the country. The games aligned with science content standards and incorporated the design process elements of story development, flow-charting, story boarding, and paper prototyping. These elements were explored before building the interaction in a digital space. Exemplary games were displayed online along with data to inform how this process impacted learning, visualization, and twenty-first Century skill development.[1]

This process is what some call "modding." Mod, or game modification, refers to the act of modifying a piece of hardware or software (or anything else for that matter) to perform a function not originally conceived or intended. In game development, there is a vast community that applies open-source principles to change popular game engines (e.g., Unreal, Neverwinter Nights, and Half-Life Source) by creating their own levels to the game. Many modders are high school students who love games and have no other creative outlet. Their final mods often serve as artifacts for college applications or job portfolios. In a sense, our game creation platform is a mod of the Unreal game engine, the most popular commercial game engine on the market. Our projects are basically asking students to mod a mod. They do this by creating new game levels that the developers of the Unreal Engine (Epic Games) did not necessarily envision or intend.

The modding process allows students to fail. "Fail" is considered a bad word in schools, but in games it is viewed more positively. In school, students often will not participate in class due to fears of being wrong or feeling negative peer pressure. We learn through failure, and cognitive failure is nearly always a prerequisite for learning success. Failure is the essence of creativity and problem solving which are critical aspects of science.

Rationale

Expert thinking/Creative thinkers

It is well documented that the phenomenon of students engaging in rote learning, being disconnected to the everyday sense of the physical world, is prevalent in US schools and universities (Hammer, 2004). Hammer's research on episodic reasoning articulates the reality that students think differently than experts. The notion of episodic reasoning suggests that the use of rote memorization by students, and their subsequent conceptions often lack clarity with regard to common sense and basic logic. For conceptual change to occur, learners must become dissatisfied

[1] http://www.ncgraduate.com

with their present conceptions and engage in cognitive conflict. The result of this conflict produces more expert conceptions (Posner, Strike, Hewson, & Gertzog, 1982).

Experts think deliberately and creatively. Through mental representations, experts swiftly scenario plan and respond with methodical actions. Research suggests that high-order, expert thinking requires a minimum of 4–5 h of high concentration and deliberate practice (Ericcson, Prietula, & Cokely, 2007).

Cognitive variability (Siegler, 2007) is at the heart of expert instructional practice. Classrooms are more heterogeneous now than ever before. Cognitive variability allows for abstract thought and creativity, as more successful patterns of thinking are used more often and reinforced by expert coaches. This notion of variability is consistent between individual students and within oneself has working memory often relies on different mental models and representations to access schema. We need to divorce ourselves from the *get it right* idea of teaching science or teaching and learning in general. We have become too systematic and value *correct* ideas over higher order thinking and experimentation. As students progress through school, the system no longer allows them to think like an expert, but rather forces them to disassociate from common sense and believe science is merely a repository of facts that only genius can fully comprehend. What is important is that students construct valid ideas and, if seemingly nonsensical or counterintuitive, reinforce the need for a rationale based on empirical data and logical thought. Experts do not simply extract patterns and retrieve their responses directly from memory, instead they select the relevant information and encode that information as representations in working memory which allows for planning, evaluation, and reasoning about alternative courses of action (Ericsson & Lehman, 1996).

Play as a Vehicle for Creativity

The notion of play is sometimes controversial, but we, like Vygotsky (1978) and Verenikina, Harris, & Lysaght (2003) believe that play was the most significant *leading* activity of childhood, because "the most significant psychological achievements of early childhood age occur when children engage in play" (p. 93). Play allows people to mitigate a tension between desires and possibilities. Some people want excitement, responsibility, challenge, and growth and want to live fantastic stories. We are hemmed in by reality, which prevents us from doing things we read in science fiction, watch in a movie or experience when immersed in a video game. Vygotsky explained that through play, a child "enters an imaginary, illusory world in which the unrealizable desires can be realized" (1978, p. 93). Video games and Serious Educational Games provide these worlds.

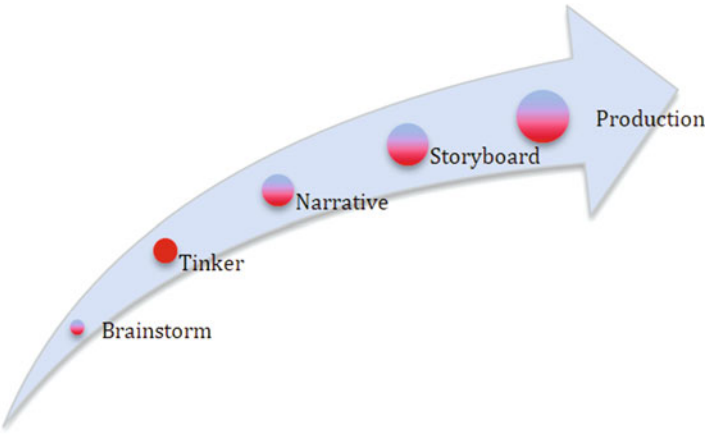

Fig. 4.1 The SEG development process

The Design Process

Integration of interdisciplinary science instruction enhances student learning in cognitive and affective domains (McComas, 2009). More than one discipline is used to tackle the driving question and complete the project. This type of problem solving is more aligned with real-world problem-solving techniques and evokes deeper learning. The combined use of project-based learning and interdisciplinary approaches encourage students to address the science standards holistically, allowing creativity to surge. The driving question fuels student motivation while content from multiple disciplines engages prior knowledge for problem solving.

The SEG design process is interdisciplinary in nature and encompasses much of the aforementioned theory. The critical first step (as our work would suggest) is that although focusing on science, it is important to be more interdisciplinary in the SEG design approach. Weaving in content from other subject areas allow for greater student engagement, time on task, and creativity. This approach guarantees that students who are tentative about science can still be creative in a safe setting because the process incorporates skill sets from other disciplines. For example, creative writing and language art skills support thinking and developing scientific ideas (Akerson & Flanigan, 2000). The five basic steps to SEG development are shown in Fig. 4.1 and are explained in the upcoming text.

The process is not unlike other project-based learning techniques. As a class, a brainstorming session begins. Students are asked about the characteristics that make a good game. They provide ideas that help the formulation of thought. At this point, we begin integration of the game software, albeit without too much structure. Allowing students to tinker with the game development software in this manner provides a visual platform of what the end game might look like. This activity is the catalysts to creativity. The structure becomes increasingly more complex beyond the first steps. Because these are educational games we ask students (while the

teacher facilitates) to choose a science topic and to align that topic with the content standards.

From the standards, we begin to build a narrative that develops a plot, settings, characters, etc. Basing the SEG on the standards requires students to learn the science concepts embedded in the narrative while creating the SEG. Creative writing is a skill that commercial video game companies look for when employing game producers. The state driven content standard(s) serve as the end goal to the game (i.e., what someone would learn after playing the game) and then backward design is employed with regard to story development. In a sense, one knows the story's ending but it is up to the students to create the narrative that leads to the end. This inventive method fuses not only language arts but also often social studies topics with STEM content. We encourage students to use what excites them and then facilitate the infusion of science. Once the narrative is complete, the next step is to storyboard. This step helps students formulate a scene-by-scene scenario; taking the creative writing to a visual creation. Here the students work autonomously and at times check in with the teacher as they go back and forth between adjusting the narrative to fit the science concepts and working with the game development software to create the desired effect in the video game. The final step is constructing the video game from the storyboard.

In Practice

What follows is a practical example of how this process unfolded in a local high school science class. It is important to understand that, before this activity, the science teacher had been involved in professional development focusing on this process. Further, it is important to know that this process takes several weeks and is often used as part of a science unit. Table 4.1 illustrates a timeline where SEGs are integrated.

As a class, this example physical science group was asked, as part of the brainstorming session, what science subject and topic they think would benefit from an educational game? What would that game look like? The results shed some interesting light on student prior knowledge (Table 4.2).

Now that students have an idea of what their SEG might look like, and the teacher knows student prior knowledge, the tinker process begins. This is important because the software, although robust, has limitations since developers are not asked to be artists, animators, or programmers—the professional skills needed to create commercial video games (Fig. 4.2).

We will share a brief synopsis from a student's narrative.

> The game is set during the gold rush in California (1849). The player (Duke) is a nucleus of an unknown atom and has to fight off evil chlorine ions while gathering electrons throughout the Noe valley around San Francisco. The end goal of the game is to become a gold (III) ion (Fig. 4.3) and find the all powerful chlorine anion (Fig. 4.4).

Table 4.1 Example timeline with SEG development

Time	Activity	Purpose
Week 1	Brainstorm	Ascertain student prior knowledge
Week 2	Tinker	Integrates technology into the curriculum; gets students excited about the project
Week 3	Narrative	Cultivates creativity and incorporates cross-curricular learning
Week 4	Storyboard	Bridges Narrative to SEG and incorporates cross-curricular learning
Week 5	Production	SEGs are developed, tested, and submitted as part of the unit's project-based requirement
Week 6	Production	
Week 7	Production	

Table 4.2 Results from brainstorming session

Science topic	Game connection
• Atoms game • Chemistry closet where students can play with mixing compounds	• Go through the electron cloud • Takes on a Role Playing Game genre • Upper levels is that you create compounds (SS-13 game example) • Make your own level or elements of their own game. Like Spore • Load screens give game clues

Fig. 4.2 Students in the *tinker* phase

Fig. 4.3 The player as a gold (III) ion

Fig. 4.4 The almighty chlorine anion

Students drew by hand or used PowerPoint to storyboard their games and constructed the final product.

Conclusion

Designing a SEG is a complex process requiring students to use backward design starting with the driving questions formulated during the brainstorming sessions. Teachers conduct the class during SEG development as a trained facilitator allowing students to work autonomously. Students creatively wrestle with science content, content from other subjects, their writing, and representative visuals of their story to produce the final product. This is all done while becoming more adept with the game development software during the tinker phase. The process of bringing all their ideas together in the storyboarding process solidifies the reality of game development. Between constructing the narrative and tinkering, misconceptions are uncovered and sometimes used strategically in the storyboarding process. Students seek out science information to transform their SEG from an idea to a written and visual representation. The projects are student driven, as their knowledge of science content is necessary to create a story about "*a nucleus of an unknown atom*" trying to become gold. The creative process takes on a life of its own when an authentic SEG design is the context within which the work of the project itself is carried out.

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Chapter 5
Creatively Teaching Introductory Psychology in Liberal Arts Institutions

Sheldon Solomon

> *Teaching is the highest form of understanding.*
>
> Aristotle (cf. Boyer, Taylor, & Boyer, 2012, p. 11)

> *Many instructional arrangements seem "contrived," but there is nothing wrong with that. It is the teacher's function to contrive conditions under which students learn. It has always been the task of formal education to set up behavior which would prove useful or enjoyable later in a student's life.*
>
> Skinner (1973, p. 15)

Like most academic psychologists, I received my graduate training at a research university where introductory psychology was taught primarily as preprofessional preparation for future psychology majors, and to provide faculty and graduate students with large pools of human participants for research purposes. Accordingly, most introductory psychology courses were organized like traditional textbooks: topical (i.e., overviews of the various subdisciplines of psychological discourse as prerequisites to survey courses in those areas; e.g., biopsychology, sensation and perception, cognitive psychology, developmental psychology, social psychology, personality psychology, abnormal psychology, clinical psychology, health psychology); ahistorical; and, insulated and isolated from other academic disciplines. Specifically, each class session was devoted to a different topic—"*Today we will talk about developmental psychology; next week we will move on to personality*"—with little effort devoted to conceptually justify the ordering of course materials. Moreover, there was scant attention to describing the historical antecedents and development of important psychological constructs; indeed, except for a perfunctory nod to the ancients in the introductory chapter of most textbooks, one got the sense that we did not know very much about human behavior until the end of the twentieth century, and that psychology was generally unrelated to other academic disciplines.

This is how I taught introductory psychology when I arrived at Skidmore College in 1980, and where I expected the same very favorable student evaluations

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I was accustomed to receiving in a university setting. And although Skidmore students were encouraging in their professions of admiration of my technical expertise and enthusiasm for psychological science, they also were not shy in observing that I seemed blithely unaware that not everyone enrolled in introductory psychology wanted to get a Ph.D. in experimental psychology, and that my topical presentations seemed like, as one student put it, "an endless barrage of disassociated facts," resulting in a classroom experience that another student portrayed as "a non-pharmacological intervention for insomnia."

This feedback got me thinking about how to teach introductory psychology in a college environment; that is, how to prepare prospective majors for future study and preprofessional training, while simultaneously engaging and informing other students with a more general interest in the liberal arts. In 1984, Skidmore received a grant from the National Endowment for the Humanities for a summer workshop for curriculum development and improving undergraduate instruction. This gave me an opportunity to redesign my introductory psychology course to address these concerns. Truth be told, I spent most of the summer looking out the window (it was lovely that year!) and doodling on my tennis shoes, until a few minutes before I had to do a short presentation to my colleagues in the workshop describing what I had accomplished. In a bit of a panic, I opted for the academic equivalent of a "Hail Mary" football pass and blurted out that I was going to transform introductory psychology from a topical, ahistorical, academically insular venture to a "*sequential hierarchy of multimodal interdisciplinary recursive experiences*."

I thought at first that the stunned silence in the room when I stopped talking was the result of my colleagues' shock and disbelief at how little I had accomplished that summer. They were however, stunned that I had accomplished anything at all from my 6 weeks of window gazing and defacing footwear. When pressed to elaborate on my fortune-cookie like proclamation, I said that I intended to teach introductory psychology sequentially—that the course material would be ordered conceptually with explicit efforts to explain why and how each area of inquiry was related to what came before and afterwards; and, hierarchically and recursively—that course material would be progressive and recursive in that ideas at the end of the course required understanding simpler concepts acquired at the outset of the enterprise. Moreover, I would make explicit connections between psychology and other academic disciplines throughout the course, in order to put psychological discourse in historical context and to demonstrate its relevance for nonmajors. Finally, the course would be multimodal in the sense that I would use materials such as literature, films, and music in addition to a textbook—to provide a more engaging and expansive view of psychology.

I was subsequently more than a little surprised when the chair of the psychology department (a fellow workshop participant) encouraged (i.e., expected!) me to actually implement this pedagogical strategy, and it took a few years of incremental changes to do so. Here is an overview of how the course is presently constructed and presented.

Creatively Teaching Introductory Psychology in Liberal Arts Institutions

In the first class meeting, I ask students to consider the term psychology as a juxtaposition of Aristotle's (In *De Anima*, cf. Cohen, Curd, & Reeve, 1995) notion of "psyche" and the suffix ". . .ology" (derived from the Greek "logos" = the study of). For Aristotle, psyche, or soul, is the essence of a natural body imbued with life. Moreover, the psyche is inextricably bound to the body and determined by the structure of the body; for example, the soul of an axe (if it was alive) would be to chop; the soul of an eyeball (if it was alive) would be to see; the soul of a grasshopper is to jump; and, the soul of a human is to reason. Psychology is thus *the study of the essence of humanity*. This conception of psychology provides an important conceptual thread that pervades and connects each of the (sometimes seemingly disparate and unrelated) sub-disciplines of psychological inquiry. From cognitive neuroscience, to sensation and perception, to learning and memory, to motivation and emotion, to language and consciousness, to stress and coping and health psychology, to personality and social psychology, to abnormal and clinical psychology—one must consider what human beings have in common with all other forms of life, and how humans beings are uniquely and distinctly different than all other forms of life. Additionally, by this definition, most academic disciplines in a liberal arts institution (e.g., art, literature, philosophy, history, sociology, anthropology—to name just a few) implicitly or explicitly overlap with psychology in that they are all concerned with describing, explaining, and expressing various aspects of human affairs. Furthermore, we are all psychologists of sorts whenever we wonder why people (including ourselves) behave the way that they do.

These notions then lead to a consideration of the methods that distinguish psychological science from other social sciences and the humanities. Here most introductory psychology texts do an admirable job of explaining: the pitfalls of drawing psychological inferences from personal introspection or naïve observations; the value of correlations to establish relationships between variables, and the dangers of the third variable problem and making causal inferences from correlational relationships; the unique power of the scientific method for establishing causality with proper control groups and random assignment of participants; and rudimentary descriptive and inferential statistics.

In addition to textbook accounts of methods, I introduce journal articles of empirical studies here (and subsequently throughout the course) to give students a more direct sense of how research is actually conducted and to discourage them from thinking uncritically and assuming that something is true because it is reported in a textbook or a journal. Some of the research reports are of experiments that lack proper control groups, or have obviously confounded manipulations, or dependent measures of dubious validity; here students are invited to design experiments that would in principle rectify these deficiencies. Other experiments are presented that were designed to determine the relative merits of competing hypotheses in order to

demonstrate that this can only be accomplished by devising conditions where the rival hypotheses make different predictions.[1]

The methods section of the course concludes with a discussion of why the scientific method entails a fundamental asymmetry between confirmation and disconfirmation; specifically, that hypotheses can be more easily disconfirmed than (if ever) unambiguously confirmed. This point is, according to Thomas Kuhn in *The Structure of Scientific Revolutions* (1962), an important antidote to the mistaken impression conveyed by most psychology (and other natural science) textbooks that science progresses in a linear fashion as hypotheses are confirmed leading to the accumulation of knowledge culminating in absolute truth. Students are now epistemologically equipped to consider ensuing course material as provisional and subject to revision in light of future research, and view themselves as active participants in an ongoing collective enterprise (i.e., psychological science) rather than passive receptacles of received wisdom.[2]

The next unit of the course (indeed, most introductory courses) consists of biopsychology (brain and nervous system), sensation, and perception. Here I find that students (especially nonmajors) are often put off by what seems to be a large body of overly technical material that is not obviously relevant to psychological concerns. Consequently, it is important to carefully articulate why these subjects are central to psychological discourse. I remind students of Aristotle's claim that the "essence" of life depends on the structure of living bodies; and, that accordingly, there is no such thing as a disembodied thought, feeling, or behavior. This is followed by a review of Darwin's theory of evolution by natural selection, culminating with Darwin's observation at the end of *Origin of Species* (1859/1999, p. 395, 396, 397, 399, and 400) that:

> . . .probably all the organic beings which have ever lived on this earth have descended from someone primordial form, into which life was first breathed. . .when we regard every production of nature as one which has had a history. . .every complex structure and instinct as the summing up of many contrivances, each useful to the possessor. . .how far more interesting. . .will the study of nature become! . . .In the distant future I see open fields for far more important researches. **Psychology will be based on a new foundation**. . .

[1] I use different materials each semester. In Spring 2012, students read Shedler and Block (1990) and Cohen, Sullivan, Solomon, Greenberg, and Ogilvie (2011) to get a sense of how research is actually conducted (about questions that have traditionally been dismissed as not being amenable to empirical inquiry); Rice (1997) as an example of flawed research (where dubious findings and erroneous conclusions are subsequently magnified by Steven Pinker's (2002) uncritical acceptance of them in *The Blank Slate)*; and, Snyder, Tanke, and Berscheid (1977) and Haselton and Gildersleeve (2011) as examples of fine research devoted to interesting areas of inquiry.

[2] Skidmore students, like those in most introductory psychology courses, are required to serve as participants in research projects. Although this requirement is primarily imposed to serve researchers' interests, participating in experiments is a great way to get a first-hand glimpse of how research is actually conducted, and at Skidmore we insist that experimenters provide thorough debriefings so that (in addition to the ethical imperatives) introductory students learn something of substantive value from their experiences. Indeed, my own interest in experimental social psychology was gestated in part from participating in a study of self-serving biases as an undergraduate majoring in chemistry at the time.

> [*my emphasis*] Light will be thrown on the origin of man and his history. . .There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

I find students more receptive to studying the structure and function of the nervous system and sensation and perception when these subjects are framed in functional terms from an evolutionary perspective. Specifically, staying alive and successfully reproducing requires extracting information from one's surroundings (perception and sensation); getting "information" from peripheral sense organs to the spinal cord and the brain; making "decisions" about how (or if) to respond; and, getting "information" from the central nervous system to reflexes and the somatic nervous system in order to execute those decisions.

I then try to provide this kind of conceptual and historical framing for every chapter in the textbook[3] to foster integration of the subareas of psychology and lend a sense of coherence to the entire experience.[4] Along the way, I try to highlight connections between psychological discourse and other areas of academic inquiry, especially from art and literature—in part because artists (poets, novelists, playwrights, and filmmakers) generally come up with ideas long before psychologists get to them. Additionally, and perhaps more importantly, students often find literary allusions more readily accessible than psychological formulations. Consequently, strategic use of poems, novels, films, plays, visual images, and music is very effective for engaging students' attention and enhancing their understanding of psychological phenomena.

For example, I use passages from Vladimir Nabokov's (1966) *Speak Memory* and James Joyce's (1916) *Portrait of an Artist as a Young Man* to illustrate contemporary psychological depictions of autobiographical memory, and Spike Lee's (1989) film *Do the Right Thing* or (more recently) Paul Haggis' (2004) film *Crash* while studying prejudice and the psychological underpinnings of human violence. Mark Vonnegut's (1975) *Eden Express*, Temple Grandin's (1996)

[3] Ideally this kind of conceptual and historical framing should be provided in introductory psychology texts, but I find this lacking in most contemporary books. In my opinion, only the earliest (first and second editions) of Henry Gleitman's classic *Psychology* (Norton, originally published in 1981) approximated what I believe should be standard fare in this regard. I currently use the 2nd edition of *Psychology* by Schacter, Gilbert, & Wegner (Worth, 2010) because it is fairly rigorous and student friendly (i.e., easy to read and peppered with contemporary examples from popular culture and humorous throughout).

[4] In a recursive fashion at timely moments in the course; for example, in the first part of the course students learn that continuous positive reinforcement is effective for rapid acquisition of a desired response that is however extinguished rapidly when rewards are discontinued. Then in anticipation of studying different approaches to psychotherapy, I ask students to ponder how token economies designed by behaviorists might work to reduce hoarding by OCD patients, and hope that they can extrapolate from what they learned earlier in the term to posit that token economies based on continuous reinforcement are effective in clinical settings as long as reinforcement persists, and recognize the benefits and pitfalls of this kind of clinical intervention.

Thinking in Pictures, and Kay Jamison's (1997) *An Unquiet Mind* are fine first person accounts of schizophrenia, autism, and bipolar disorder respectively. Edwin Abbot's (1884) *Flatland* (a fictional account of life in a two-dimensional universe) helps students understand how perception is necessarily skewed by one's physical perspective and preexisting conceptions. Mary Shelley's (1818) *Frankenstein* and Nietzsche's (1887) *On the Genealogy of Morals* anticipated many of Freud's ideas about unconscious motivation. Shakespeare's *Macbeth* (Act 5, Scene 5) anticipated modern existentialism in the early 1600s:

> To-morrow, and to-morrow, and to-morrow, Creeps in this petty pace from day to day, To the last syllable of recorded time; And all our yesterdays have lighted fools The way to dusty death. Out, out, brief candle! Life's but a walking shadow; a poor player, That struts and frets his hour upon the stage, And then is heard no more: it is a tale Told by an idiot, fullof sound and fury, Signifying nothing.

It took centuries for existential philosophers to catch up with the Bard, and for clinical psychologists like Victor Frankl and Irvin Yalom to develop therapies to help individuals construct a sense that they are persons of value in a world of meaning.[5]

Additionally, following Nietzsche's edict that "Without music, life would be a mistake," I play a varied assortment of music before every class session—often with lyrics that are relevant to the course content at the time; e.g., Bob Marley's *War* for a presentation on human aggression: "Until the philosophy that holds one race superior and another inferior is permanently discredited and abandoned—Everywhere is war." I did this initially entirely for my own benefit in order to drown out students' blathering so I could concentrate on what I was going to say that day. However, I was pleasantly surprised when students told me in person and via course evaluations that they enjoyed the music and found it relaxing and rejuvenating in anticipation of presentations that generally entailed processing large amounts of PowerPoint-less information.[6]

Finally, I encourage students to come to see me during regularly scheduled office hours (I try to set aside four hours a week for meeting with introductory psychology students), in part not only because this is a large class by Skidmore standards (100–140 students) but also because I think that direct interactions with students outside of the classroom is important regardless of class size. I also encourage students to give me detailed suggestions for future versions of introductory

[5] I offer the examples in this paragraph for illustrative purposes, rather than as an exhaustive account of materials that I have used over the years, or as prescriptions for other instructors.

[6] I use printed handouts rather than PowerPoint presentations because my sense is that students are conditioned by massive prior exposure to PowerPoint to pay attention only to bulleted information and doze otherwise.

psychology throughout the course and in evaluations at the end of the semester. I find that students resonate to the notion that previous generations of students influenced the course that they received, and the prospect that future generations will benefit from their input.[7]

This approach to teaching introductory psychology has been very rewarding for me. I would like to think that I am now a better teacher, psychologist, and researcher. More importantly, this approach to teaching introductory psychology has been very effective for both majors and nonmajors at Skidmore (and I have taught introductory psychology in this fashion at larger university settings; e.g., 200 students at Brooklyn College and 600 students at the University of Arizona). Students who enroll in the course already intending to become psychology majors report that they are well prepared for later coursework. Other students report that they became psychology majors because of their experience in introductory psychology. Nonmajors report that they find the course material interesting and relevant to their various academic interests and personal concerns.

I now teach all of my courses (e.g., personality, evolutionary psychology, consciousness) as *sequential hierarchies of multimodal interdisciplinary recursive experiences*. What originated as a "Hail Mary" pass to get me through a summer workshop has become a pedagogical heuristic that informs how I teach and has given me a keener appreciation of Aristotle's observation that "teaching is the highest form of understanding."

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[7] For example, in response to students' suggestions: there are currently four exams during the semester rather than three in the original version of the course; I do not lecture for one or two class sessions per term to give students an opportunity for careful and thorough reading of the text and associated primary materials; and, students are encouraged to write to me after each exam to provide an intellectual justification for erroneous responses that I then consider and sometimes award credit for.

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Chapter 6
The Global Reach of Creative Life Long Learning Skills for Graduate, Law, and Medical Students

Mary Banks Gregerson

Brave New Educational World Around the Globe

When I was considering graduate school, a teaching assistant told me that "undergraduate education examines the meaning of life while graduate education teaches how to make a living." Today three post-graduate venues—medical, graduate, and law—provide professional finishing ripe for innovative, creative approaches preparing lifelong learning skills. Skills on "how to learn" rapidly changing content enable students to prepare for jobs that do not even exist yet as they train (Frisch/McLeod, 2007). This business of learning professionalism for the best and the brightest in America has a global reach.

Globality and the accelerating rate of change that Toffler (1970) termed "future shock" require continuous lifelong learning (Metiri Group, 2008). Future shock itself has reached inside education. To reiterate for emphasis, students are training now for future jobs that do not exist today. Therefore, the best preparation is to teach students how to learn efficiently and effectively.

This learning preparation occurs in a "class" that does not necessarily mean "classroom." Electronics have revolutionized how and where post-graduate education is taught. For almost a decade now Australian and Canadian classrooms have taught something called media literacy (Desmond, 1997; Pailliotet, 2003; Quin & McMahon, 1995) and used popular culture texts like:

The basis of this chapter is a presentation "Creative Programs to Teach Graduate, Law, and Medical Students" given for the Invited Symposium "Creatively Teaching at All Levels Across the Educational Lifespan" at the 119th Annual Meeting of the American Psychological Association, Washington, DC.

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1. Television programs
2. Magazines
3. Videos
4. Films
5. Newspaper advertisements

As a specific example, with almost two decades of online teaching and learning, Dr. Mary Sudzina (2004) describes the specific example of her blended Web-based course as a touchstone for online teaching innovations, including video and audio clips, case studies, problem-based learning, case competitions, threaded discussion groups, CUSeeMe videoconferencing, streamed video, rubrics, Web-based final projects, and online tutorials and resources. Following Dr. Sudzina's time-proven approach, online education centrally anchors the reputation of some schools like Phoenix University, and most schools have an online component. The website Online Education Database (http://oedb.org/) offers systematic guidance to choosing quality online education experiences.

Distance learning has become big educational business, and, as such, is bowing to a market driven mentality. "Study here" billboards dot our highways (CBSOutdoor, 2009). "Learn and earn" ads move along on the sides of vehicles like public buses. Even public transport stations are not immune to hawking, or branding, as the marketers like to euphemize the process of "searing into the mind" that these educational advertisements hope to accomplish. The goal: Attract students! In this world of expanding classrooms, the numbers of students are shrinking both in America and around the world (Yonezawa & Kim, 2008).

How to attract students? Speak their language and more and more that language is electronic (Warschauer, 1998, 2011). Hobbs (2004) analyzes that these new electronic techniques aim to:

- Motivate students' interest in the subject,
- Build communication and critical-thinking skills,
- Encourage political activism, and
- Promote personal and social development.

After a student walks through the door, will s/he sit at a desk, at a computer, or in an easy chair? At school? At home? Leading edge instructional delivery combines hybrid and blended courses on-line with the use of creative programs and formats to reach and teach post-graduate students in law, in medicine, and in the liberal arts and sciences (Trail & Hadley, 2010). For the purposes of this chapter, "leading edge" means "On-Line," "On Film," "On Stage." A brief look at these three delivery approaches samples the American "brave new world" of post-graduate education and its global reach. Lastly, ethics and standards are considered relative to the new education embracing creative pedagogy.

On-Line

Educational Climate

Distance education has become a major form of education in the USA (Scheer, Terry, Doolittle, & Hicks, 2004). In the current climate of competition for student enrollments, meeting students on their own terms—and more and more that means electronic venues with engaging, challenging, stimulating, mediated, or media-derived pedagogy—could prove a deciding factor to attract and maintain allegiance of students. On-line learning does not just mean computers and the World Wide Web, it also means radio, television, and cable television. Blended programs with a range of techniques provide hybrid venues.

On-line education uses standard, inventive, and creative methods to teach courses. Standard methods include webinars, online self-taught courses, and correspondence courses. Inventive methods include serious games where play and narrative embed in one and another to scaffold learning paths from fundamentals through specialty information, and the use of social networks to further educational ends. Other chapters within the current text address other new technologies for electronic modes of education like gaming (see Annetta et al., 2012). Creative programs include mainstream entertainment repurposed secondarily for educational outcomes ("On Film"), entertainment formats adapted to educational settings, and innovative experiential exercises integrated into standard curriculum. Basic to all these media is reliance upon institutional and personal digital literacy, or what some call information literacy, for both standard and inventive teaching approaches. Digital literacy refers to the mode of accessing information whereas information literacy also encompasses the integrity of that inquiry (Trail & Hadley, 2010).

Media Literacy

Analysis of on-line learning originally identified the needed computer and research skills as "incidental learning" (Furr, McFerrin, & Fuller, 2004). It was noted that often a specialized learning environment was necessary for distance teaching. Now, though, the term "media literacy" has emerged with formal instruction establishing computer skills as core learning (Hazard & Hazard, 1961). A website titled *Understand Media: Media Education on the Web* (2012) outlines how to use online education to teach media literacy. This shift of computer skills from incidental to core learning is a hallmark of the brave new world of post-graduate education today.

A few years ago, media literacy was still far from a typical part of every young person's educational experience (Schwarz, 2005). Usually computer skills accrued from personal use. Now, computer skills programs proliferate the undergraduate

and graduate landscape. Still, teacher certification in media literacy is rare, although the National Association for Media Literacy, which adopted this name in 2008 after starting in 1997, hosts a biennial media literacy conference and produces *The Journal of Media Literacy Education* three times a year.

Implementing media literacy in the schools is especially challenging in the USA (Jenkins, Clinton, Purushotma, Robison, & Weigel, 2012). Our large, diverse, and educationally independent country traditionally has not centralized its curriculum nor has it taken seriously the popular arts. With no federal mandate, responsibility for implementing programs and standards are left to states and localities themselves. Statewide media literacy initiatives only existed in 2004 in Texas, Maryland, and New Mexico (Hobbs, 2004). So, each locality is its own fiefdom for media literacy. Clearly national initiatives need sponsorship by national educational organizations.

Teaching media literacy means not only user-friendly training for students but also that teachers adapt to new pedagogy requirements. Creating effective and efficient multimedia for Web-based instruction requires a working knowledge of human memory constructs (Warschauer, 2011) including:

(a) Working memory
(b) Dual coding
(c) Cognitive load

Online media literacy skill building precedes the effective implementation of online teaching. Otherwise uneven classroom preparation intrudes too influentially into content learning (Buck, Islam, & Syrkin, 2006). Establishing key criteria and standards through evaluation of effectiveness as well as consideration of the ethics of teaching media literacy concludes this chapter after consideration of other pedagogical approaches using film and stage approaches.

On Film

Before on-line communication established electronics centrally in post-graduate education, films were a familiar component. The repurposing of popular films from entertainment to education has gained footing in the worlds of medicine and graduate school (Gregerson, 2011). Law schools surprisingly have little documentation on the use of popular electronic media like films and television to teach although courses on law and popular culture exist with supporting texts (Asimow & Madar, 2004; Osborn, 2009). Since entertainment featuring the world of law like the multiple *Law and Order* television series are some of the most enduring and popular entertainment fare, why have law schools not capitalized on repurposing this resource?

Some light on possible answers to the question of law education eschewing popular culture may be found in the ethics and evaluation discussion in the concluding section of this chapter. Furthermore, the use of popular culture to teach is not

without critics, even in the social sciences. On October 6, 2011, psycCRITIQUES, the American Psychological Association reviewing mechanism, launched a blog on "Should Psychology Professors Use More Popular Culture to Teach?" (see http://psyccritiquesblog.apa.org/2011/10/should-psychology-professors-use-more-popular-culture-to-teach.html). The examination of what medical and graduate schools are doing with films and television sets the stage for that integrative discussion on evaluation and ethics.

Films have been used to teach medicine since the late 1890s, with a focus on the moving visual depiction of various diseases (Essex-Lopresti, 1997). In 1944, Longland, MacKeith, and Stanford commented in the *Lancet* on the use of film in teaching medicine. Two texts now exist on using films for educational purposes (Alexander, Lenahan, & Pavlov, 2005; Wedding & Boyd, 1999). Sampling worldwide activity shows growing global acceptance in medical education for film over 100 years:

(a) Austria, Germany, Britain, and US, 1897: Within a year of the advent of motion pictures as entertainment technology, medical education used cinema in Vienna to teach about mammalian heart action, in Berlin for lectures to show different diseases; in Glasgow depicting joint movement in the knees, and in New York revealing microscopic life (Essex-Lopresti, 1997).
(b) Spain, 2005: Baños noted the use of film to focus on the doctor-patient relationships in order to train students to treat patients, and not diseases. (Albaladejo & Sánchez, 2011; Baños, 2007; Baños, Aramburu, & Senti, 2005).
(c) USA, Maryland, 2003: Welsh (2003) reported that viewing popular films about addiction and intoxication with its withdrawal helped over 90 % of second year medical students to learn. In 2008 at the University of Saint Mary Overland Park Campus, I used the classic film "West Side Story" (Robins & Wise, 1961) to teach multicultural psychology, and students praised highly the depth of understanding from its messages.
(d) Argentina, 2009: For over a decade Juan Jorge Michel Fariña (2009) reported teaching bioethics and human rights to medical students using popular film and television series.

Popular films have depicted a range of medical phenomena, including: Addiction medicine (Cape, 2009); psychiatry (Fritz & Poe, 1979); psychopathology (Buda, 2010); memory (Kelley & Calkins, 2006); family therapy (Manfrida, 2005); couples counseling (Shepard & Brew, 2005; Toman & Rak, 2000; Villalba & Redmond, 2008); and systems thinking (Stinchfield, 2006). Through a recent survey study of educational consultants, education associate deans, and foundation program directions, Darbyshire and Baker (2011) concluded that popular film is a promising but underutilized educational method in the USA.

Whenever and wherever a multinational, multiethnic student population occurs, the conditions are ripe for popular entertainment fare to sweeten the medicine of teaching. In a community college in Northern Virginia, I used popular films to teach social psychology to a student group with vastly varied ethnic and religious backgrounds; the use of films provided a shared reference point to spark discussion

of concepts and their "real/reel" world appearances. For example, a comparison of two films, the "To Kill A Mockingbird" (Mulligan, 1962) and the "A Time to Kill" (Schumacher, 1992), produced 30 years apart reveals both how culture affects people and how culture changes overtime. Whether or not this repurposing unwittingly panders to lower level appetites is considered at the conclusion of this chapter. Still, the use of such global products levels the playing field of diversity with a cohesion-enhancing reference point.

Others have taught undergraduate courses using popular films as educational tools (Badura, 2002) in social psychology (Roskos-Ewoldsen & Roskos-Ewoldsen, 2001) and pharmacology (Ventura & Onsman, 2009) as well as teacher preparation (Beyerbach, 2005; Grant, 2002; Tillman & Trier, 2007). An English class used popular film to critique interpretation of reel vs. real events (Mackie & Norton, 2006) and another continuing education class taught citizenship (Zook, 2002). At Alliant University in San Diego, CA, Blumberg (2012) reports"using film as a tool to teach psychology students to identify, demonstrate, and integrate principles" in courses on cognitive psychology, social psychology, personality, abnormal/clinical psychology, and developmental psychology. Sometimes he chooses the film to illustrate a principle, and sometimes the students bring examples from films watched independently. Blumberg added, "films are an accessible way for students to connect with what they read in textbooks." Clearly the use of popular films is spreading through both graduate and undergraduate venues.

But, what of moving from the remote mediated electronic world of on-line and on film to the more immediate experiential approach of "on stage?"

On Stage

In-class dramatizations can bring experiential (Itin, 1999) immediacy to learning to maximize the lessons imparted. Educational research has shown that the more of the senses involved, the greater the learning (Metiri Group, 2008). Besides capturing attention and permitting exploration, the experiential learning of dramatizations seems to endure.

For instance, while teaching undergraduates in America in the District of Columbia at The George Washington University, I had students create a dramatization of the gate control theory of pain. In this dramatization, some students lined up as the spinal cord, one student was the brain, one was the mouth, two on either side of the spinal cord served as the gates, and others were the various nerve fibers. Then students pantomiming nerve impulses started up the nerve fibers, and only when enough student "nerve impulses" had gathered at the gate, did they as the impulses pass to the spinal cord and then the brain, whereupon the mouth said "ouch." Ten years after this class one of its former students approached me in a grocery store, excitedly repeating verbatim for me the "gate theory of pain," and enthusiastically thanked me for such an excellent class. His recall was correct! Others report such simulations receive mention in student feedback—Beghetto

elsewhere in this volume explains "micromoment" simulations to teach appreciative K12 teachers how to foster creativity in discussion arcs within the classroom.

Other post-graduate classrooms have turned to dramatization for teaching not only content but also professional moves. In this volume, Shapiro and Walker describe the popular and impactful use of dramatic simulations to teach forensic psychology to graduate students. Elsewhere, Baylor Law School in South Carolina in early October 2006 staged a fashion show based upon the television reality contest "Project Runway" (Dengler, 2012). Four law students modeled different attire appropriate for the various activities of a lawyer. For instances, highlighted venues were holding a deposition, presenting a case before the Supreme Court, and meeting a client in jail. This "show" was judged by a panel of three female law professors, three male law professors, a federal judge, the school's assistant dean, and a practicing attorney from the area who provided commentary on why the outfits were appropriate and suggested other options. In addition, slides with examples of inappropriate attire were shown, and the panel commented on why these outfits were not appropriate.

Such learning from experience, or "experiential learning," capitalizes on combining real world involvement with didactics (Beard, Wilson, & Irvine, 2002). Instead of watching a film on the gate control theory of pain, in experiential learning students activate these concepts, actually becoming pain impulses that amass until passing a threshold where a realized "ouch" occurs. This legitimate pedagogical approach today reaches education globally. Around the world, student activities enliven conceptual learning. Not all educators embrace this approach uncritically (Stavenga de Jong, Wierstra, & Hermanussen, 2006).

Ethics and Standards

A critical view toward these creative approaches in post-graduate education rests upon standards and ethics. Standards pertain to criteria relevant to effectiveness. Ethics rests upon considerations of right and wrong. On-line, on film, and on stage techniques have ethical considerations, if not standards, at this juncture in American education.

Birenbaum (2003) criticized Web-based learning environments for being driven by technology rather than by learning theories. Form and function eclipse content. That challenge exists still today almost a decade later. Until the mastery of the technology ceases to preoccupy educators, learning these new "toys" and techniques crowd the foreground. As their mastery occurs, concomitant explanation of learning theories needs to "color in the lines." Otherwise, a technological solipsism obtrudes into maximizing the lessons learned and becomes simply whiling away the time pleasantly.

The movement toward standards for assessment and evaluation of Internet distance learning (Olney, Chumley, & Parra, 2004) could beneficially also be applied to the efficacy of film and stage dramatizations to teach. Evaluation of

the effects of any pedagogical device, including technology, media, and dramatizations, should be second nature to educators. It is not, though (Mertens, 2004).

Now, distinctions are being made, for instance, in the theory and application concerning teaching and learning in online distance education courses and desktop video conferencing (Furr, McFerrin, & Fuller, 2004). For example, Stephenson reported in 2004 on a new model of learning like the Internet mirror model. In this model, parallel lecture and Internet-based sections occur concomitantly so students can move freely between the two during the semester or choose both. Compared to traditional approaches, these innovative courses had broader and deeper content coverage with no reduction in exam scores, with a 95 % retention rate, increased student satisfaction, and a 70 % decrease in students dropping or failing the course (Stephenson, 2004).

Terry and her colleagues in 2004 synthesized research on human memory, cognition, and learning in order to provide multimedia practitioners with a set of basic principles for designing multimedia for meaningful Web-based teaching and learning. Details of the principles to guide design of distance education courses have been articulated elsewhere (Scheer, Terry, Doolittle, & Hicks, 2004).

Finally, setting standards, principles, and policies for on-line learning are starting to be codified. The Institute for Higher Education Policy (2000) book *Quality On the Line* identifies 24 benchmarks like Institutional Support and Course Structure considered essential to ensuring excellence in Internet-based distance learning (see Table 6.1). Such benchmarks could be systematized for experiential learning and for the educational repurposing of popular culture like films. The presupposition is that each of these approaches is taken seriously as a legitimate education mode, and that universal standards that transcend cultural and learner boundaries can exist for each (Roh & So, 2005).

Conclusion

Today in America the phrase “reach out and touch someone” oftentimes means through the media, even in the developing world. In 1992 at the end of our horseback ride over Egyptian desert dunes, my Bedouin guide fished out from his traditional cloak his cell phone, jangling with a reverberating echo in the vast silence, and dispelling my romantic, idealized vision.

Furthermore, in education and the further reaches of culture, face-to-face no longer means breathing the same air. And, playing games like pantomimes can have the serious intent of teaching. The times are a-changing, and creativity is commanded in designing and offering education, and in evaluating it.

Creativity exists in the post-graduate classroom. Creative courses in law school, medical school, and graduate school aim to reach, to teach the student of today—The “wired” student, the student film buff, and the student thespian. When we meet

Table 6.1 Benchmarks for success in internet-based distance education

Institutional Support
1. A documented technology plan that includes electronic security measures (i.e., password protection, encryption, back-up systems) is in place and operational to ensure both quality standards and the integrity and validity of information.
2. The reliability of the technology delivery system is as failsafe as possible.
3. A centralized system provides support for building and maintaining the distance education infrastructure.
Course Development
4. Guidelines regarding minimum standards are used for course development, design, and delivery, while learning outcomes—not the availability of existing technology—determine the technology being used to deliver course content.
5. Instructional materials are reviewed periodically to ensure they meet program standards.
6. Courses are designed to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.
Teaching/Learning
7. Student interaction with faculty and other students is an essential characteristic and is facilitated through a variety of ways, including voice mail and/or email.
8. Feedback to student assignments and questions is constructive and provided in a timely manner.
9. Students are instructed in the proper methods of effective research, including assessment of the validity of resources.
Course Structure Benchmarks
10. Before starting an online program, students are advised about the program to determine (1) if they possess the self-motivation and commitment to learn at a distance and (2) if they have access to the minimal technology required by the course design.
11. Students are provided with supplemental course information that outlines course objectives, concepts, and ideas, and learning outcomes for each course are summarized in a clearly written, straightforward statement.
12. Students have access to sufficient library resources that may include a "virtual library" accessible through the World Wide Web
13. Faculty and students agree upon expectations regarding times for student assignment completion and faculty response.
Student Support Benchmarks
14. Students receive information about programs, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, and student support services.
15. Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, government archives, news services, and other sources.
16. Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.
17. Questions directed to student service personnel are answered accurately and quickly, with a structured system in place to address student complaints.
Faculty Support Benchmarks
18. Technical assistance in course development is available to faculty who are encouraged to use it.
19. Faculty members are assisted in the transition from classroom teaching to online instruction and are assessed during the process.
20. Instructor training and assistance, including peer mentoring, continues through the progression of the online course.

(continued)

Table 6.1 (continued)

Faculty Support Benchmarks
21. Faculty members are provided with written resources to deal with issues arising from student use of electronically accessed data.
Evaluation and Assessment Benchmarks
22. The program's educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards.
23. Data on enrollment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness.
24. Intended learning outcomes are reviewed regularly to ensure clarity, utility, and appropriateness.
Empirically Derived New Benchmarks
--- *The reliability of the technology delivery system is as failsafe as possible.*
--- *Faculty and students agree upon expectations regarding times for student assignment completion and faculty response.*
--- *Questions directed to student service personnel are answered accurately and quickly.*

The Institute for Higher Education Policy (2000)

the student at least halfway as well as stick to our pedagogical principles, the brave new world classroom disseminates appropriately training, information, and skills.

Yet, is this "good?" Greenberg (2009) has questioned "Tinseltown teaching," noting that repurposing of entertainment products may miss the mark. The dramatic license exercised in dramatized depictions may gloss over, distort, or even redefine the meaning of concepts. Cavalier use of existent popular films depart from the venerable Sabido method (Sabido, 2012), which produced entertainment with proven social value. The entertainment existed because of the educational purpose.

Conceptual integrity, scientific soundness, and careful evaluation characterize the Sabido Method. In this approach, media professionals select a concept and conduct survey research with a target population to identify relevant key cultural myths, concerns, and characters. Jungian archetypal psychology (1981) and Bandura (1977) behavioral change theory guide the design and staging of Sabido entertainment fare presented over years in order to bring about target behavior and cultural change. These theories work hand-in-hand to devise a "values grid," which grounds characters and story arcs. Finally, an independent market research group evaluates and documents the cultural effects. Hundreds of programs around the globe have produced a targeted behavior change (Singhal, Cody, Rogers, & Sabido, 2004). For example, after years of population control-driven serialized television programming, the predominantly Catholic country of Mexico won the 1996 United Nations Population Prize (Population Media Center, 2003–2009). Such a conceptually and scientifically strong marriage provides the epistemological foundation needed to explain entertainment not repurposed but pre-purposed to change for educational and cultural as well as entertainment ends.

This example demonstrates that conceptually based design and scientifically extracted evaluations can occur (Trail, Gutierrez, & Lechner, 2006). It is simply a matter of priorities. At this cultural digital hinge, forward movement could and should have progressed in educational theory and science. Otherwise it is simply

business as usual and not really education. Education with integrity can spread around the world just as the Sabido Method has spread globally relevant entertainment with proven social value.

Globality. The worldwide reach permitted by the Internet and other electronic media prompted universal design learning (UDL) principles (CAST, 2000). Bowe (2000, p. 4–5) surmised two basic differences of built-in flexibility and improved access to learning in modern global electronic approaches, and identified comfort, convenience, and diversity as hallmarks, with four considerations:

1. Many ways to present information.
2. Offer students choice from many ways to interface with and respond to course and supporting documents.
3. Offer students many ways to find meaning in course content for personal motivation.
4. Utilize curricula and personal Web sites.

The irony of global web-based instruction is to effectively span the world with its diverse populations with measureable standards that accommodate the individual personal learner. Lechner (2000–2001) identified as one standard globality debate about enforced homogeneity of standards which evaporates cultural diversity. Within this standardization principle that unites learners globally is also the necessity to consider demographics like age and disability. So, the variation exists within the learning process to bring each individual learner to the standard of knowledge. Henry (2002) also cautioned that considerations of age and disability were necessary to achieve the spirit of educational justice. Still, this emphasis on diversity in the educational processes to meet uniformity in standards skirts the issue of the value of the disappearance of cultural diversity. Does globality make us better, that is, unite us, or does it make life worse, creating Stepford (Levin, 1972) learners awash in uniformity devoid of cultural and individual variety? This question does give pause when celebrating the increased capability such global connectivity affords.

As demonstration, Professor Michael Wesch noted in his 2008 Library of Congress talk *An Anthropological Introduction to YouTube* that the World Wide Web permits "collaboration across time and space." While in the basement of his Kansas farm house, he collaborated with a musician in Africa to produce his 2007 YouTube video *Web 2.0: The Machine is US/ing Us*, which has gone viral with tens of millions of hits. Such global partnerships are based upon electronic connectivity.

Dr. Wesch's 2007 creative video complements the 2007 Frisch/McLeod *Shift Happens: Did You Know?* YouTube video noted at the outset of this chapter. Both viral videos produced the same year affirm McLuhan's concept of the global village (1964) as well as the gap between the education culture of today being instantly outmoded in content by requirements of unknown jobs of tomorrow. This future shock squarely puts in the foreground the process of learning per se with actual content receding into the background. Shakespeare's Edmund in *King Lear* as the apt mouthpiece of post-graduate students of today and tomorrow could be talking about the global bounce back of creativity in education:

Th' hast spoken right, 'tis true.
The wheel is come full circle. I am here.
King Lear Act 5, Scene 3, 171–175
W. Shakespeare, 1608

"Here" is "there," as well.

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Chapter 7
Teaching Music Theory Fundamentals Creatively

Suzanne Court

The learning and teaching of music theory fundamentals presents a conundrum: music is creative in most aspects of composition, performance, and reception, yet a survey of approximately fifty didactic texts, introducing notation and basic musical structures, indicates that most are presented in ways which do not recognize the creativity of either the student or the subject itself.[1] Not surprisingly, a common student attitude towards the subject is one of negativity. Anecdotal evidence suggests that it is not uncommon for a budding musician to embark on learning music theory fundamentals, and in the process to quell the flame of enthusiasm for music. As Howard Gardner indicates, "knowledge about music" can involve a cost when a formal mode of analysis is brought to the subject. He suggests that what would have been "naturally perceived" up to the point of learning music theory, may be "wiped out [as] an individual attempts to assess and classify everything according to a formal mode of analysis" (1985, p. 111). Should not the learning of music notation and theory be a creative experience whereby prior experiential learning is integrated with formal analysis?

In my survey of late twentieth- and early twenty-first-century textbooks on music theory fundamentals I have found that the majority fail to fully explore creative learning possibilities. "The *creative* in "creative learning" means being innovative, experimental, and inventive, but the *learning* means that . . . participants engage in aspects of knowledge enquiry, [with] intellectual enquiry around *possibility thinking* and *engagement with problems*" (Jeffrey, 2006, p. 11).

[1] The following comprise a sampling of the music theory texts in the comparative study, confined here to some publications from 2000 onwards: Benward (2000), Benward and Saker (2003), Damschroder (2002), Duckworth (2003), Earl (2003), Henry (2003), Kolb (2005), Manoff (2001), Miller (2005), Pilhofer and Day (2007), Richer (2002), Steinke and Harder (2003), Straus (2003), Surmani, Surmani, and Manus (2004), Tagliarino (2006), Takesue (2010), Taylor (1989), Turek (2007), White (2003).

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I posit two reasons why the possibilities for creative learning are generally not fully explored in didactic music theory texts. First, there is an observable disconnect between modern instructional approaches and those of the European music theorists who initially developed music notation systems. This is a shame because they have much to teach us. It is especially helpful to realize how and why certain signs and symbols were developed. This information is readily accessible. Some of the innovators of the system, such as the author of the St. Gall Manuscript are anonymous; others are known and their works are preserved, but to become familiar with them it is not necessary to delve into the archives since there are a number of cogent and accessible accounts of this material (e.g., Apel, 1942; Parrish, 1957; Rastall, 1983; Reese, 1941; Sadie, 2000). Second, didactic music theory (as distinct from theory as a bone-fide field of musicology) seems to be driven by the need to be factually objective (positivistic), thereby alienating itself from the very creativity that attracted many students to music in the first instance. Paul McIntosh asks why something that can move us so deeply cannot be matched by literal or factual text at the same level of emotional engagement. He also asks why it is considered that "professional, academic and research writing should remain objective and factual in order to be credible" (2010, p. 85). Elliot Eisner suggests that the problem with art generally is that it is not considered a form of knowledge in contemporary and philosophical thought, that the arts have been traditionally "regarded as ornamental or emotional in character ... rather than primarily informative" (2008, p. 3). The sources I have studied suggest to me that continual acceptance of an uncritical tradition of didactic music theory writing, along with an tacet collective desire for fundamentals of music theory to be accepted at the boundaries of traditional musicology, have supported a bias towards a largely positivistic approach. Preference for factual accuracy has taken precedence over the possibilities of applying creative learning theory from educational research, as well as that of the cultural, esthetic and critical approaches of modern musicology.

A Modern Textbook Example

Here I introduce an example from a music theory textbook, with a view to observing what, and how, it presents the subject in the very first chapters. The example happens to be one of the better texts in terms of my general criticism above, and indeed it was my textbook of choice until I began to question the premise of didactic music theory generally. *Practica Music* is well supported by new editions, a Web site, and a very useful CD Rom of music examples (Evans, 1999). Nonetheless, it is representative of common approaches to the subject, begging critical analysis. First, it follows the almost universal sequence of topics, starting with the notation of pitch, which happens to be the hardest of all the musical elements to explain and understand. Second, the written text offers largely familiar descriptions and explanations, which if subjected to logical thought are likely to

draw the reader into circular arguments. Not much cognitive thought is demanded of the learner, rather the emphasis is on rote learning. There are much worse examples of music theory textbooks; typically, those that have the word "rudiments" embedded into their title (a word I came to hate as a child) in which fragments of seemingly unrelated facts are presented, usually in alphabetical order. Sadly, the greatest criticism that can be leveled at this example, and many others, is that the approach predetermines that students leave their creativity out of the learning experience.

A better model, in my opinion, would be to start with the topic of rhythm. Why is this better? In many world cultures, rhythm is the first musical element to be systematically developed, since it is both embedded in vocal melody and can be developed more or less independently by utilizing readily available objects with inherent percussive properties. It is also the first form of musical expression from human babies. The special place rhythm holds is rarely recognized in music theory books: the much more complex topic—the notation of pitch—is typically where texts begin.[2] I suggest that this is because melody is privileged over rhythm as an element in Western Classical (Art) music.

It is how *Practica Musica* launches into the notation of *pitch* that is of most concern. In the second paragraph of the opening chapter, the reader is told that *pitch* is a necessary precursor to understanding *melody*. This is put in the context of the *scale,* which is explained as a set of *pitches* consisting of small and large musical *steps*. Already, the argument is circular. It is pointed out that the small and large steps are called *half-steps* and *whole-steps* respectively (without mentioning that in half of the English-speaking world these are called *tones* and *semitones*). The *half-step* is described as the smallest distance between two *keys* on the piano, while the *whole-step* is explained as being equal to two *half-steps*. This explanation is devoid of real meaning (1999, p.1).

Facing the same challenge of all authors in this subject, Evans needs to enable the reader to become confident with individual technical terms (those here in *italics*), which are contingent upon the understanding of other higher order concepts that in some cases require an understanding of physics and acoustics for full comprehension. For instance, in order to understand what a *half-step* is, the reader is told she needs to know how the *keys* are ordered on a piano. But has every student seen or touched a piano, and do they know why some keys are black and some white? This is a higher order question, which is probably why Evans side-steps the issue. At this stage the student is unlikely to know what purpose *half-steps* and *whole-steps* serve (and goodness knows what sort of visual images might be conjured up from the words "keys," "steps," and "scales" which have other everyday meanings), but she is told that it is something to do with *scales*. She is being asked to process these terms in a circular argument in which the comprehension of *steps* and *keys* (those on a piano) is a precursor to understanding *scales* and *vice versa*. Evans might well have been compromised by believing that by the end of the

[2] There are some exceptions to this, two of them being Pilhofer and Day (2007) and Richer (2002).

course (or book) the student would form, retrospectively, a Gestalt understanding of the detail. This is understandable—as a teacher of the subject over several decades I too have clung to this belief, but there are ways around this problem.

Fundamentals of music theory exist in an environment of high-connectivity rather than one of low-connectivity. The complexity of music theory is such that it is almost impossible to understand one element without taking others into account. The elements of music are highly connective: melody cannot be separated from rhythm, and it cannot help but imply harmony. No single musical element can exist on its own. While these elements can be studied individually to some extent, they cannot be fully understood "until all of the elements and their interactions are processed simultaneously" (Paas et al., 2003, p. 1). High-element interactivity material is very difficult to understand: Renkl and Sweller point out that "different materials differ in their levels of element interactivity and thus intrinsic cognitive load, and they cannot be altered by instructional manipulations." They suggest that the only way to reduce this kind of load is to simplify the learning task, omitting some interactive elements, even though this will "compromise sophisticated understanding" (2003, p. 1). This is the sort of compromise that authors of music theory texts have repeatedly been compelled to make, but rather than simplifying the *learning task*, the majority simplify the *facts*, ignoring or glossing over the issue of element connectivity. The assumption seems to be made, in the main, that everything will make sense eventually. The problem is that most music students are highly motivated to understand the logic behind the strange graphic symbols, so much so that in a classroom they might stop just short of accusing the professor of making up a particularly illogical system just to befuddle them. "Can't there be a better notation system," they might ask? Well, possibly, but we are stuck with the system that was developed in Europe from the ninth century and which has evolved into the form it is today. We can't change that, but we can use history to help us by exploring the logic and tapping into the creativity of the inventors of the system. This is what I attempt to demonstrate below, but first let's look at the explanation in the sample textbook for the five lines of the *staff*.

In common with most other texts, *Practica Musica* tackles the five-lined *staff* early on, probably because it is the graphic symbol upon which the whole system of Western music notation hangs. Along with an introduction to the *staff* goes an explanation of *clefs,* since these two concepts are integral to each other. We are told how the five lines of the *staff* have symbols (*notes*) attached to them to represent high and low pitches, and that a *clef* sign placed at the beginning of a *staff* indicates "which lines are which" (i.e., what letter names they have). Again, the beginner student is likely to be lost in a circular argument. The concept of *notes* (*pitches*) written as round blobs sitting on, or between, parallel lines is entirely unrelated to the experience of sound for the reader. Why are these particular symbols used? How do they relate to sound? What on earth do they mean? Assumptions around the spatial elements of written music might add further confusion. The reader is shown the two *staffs* (treble and bass) connected together as in a piano score (although how they work together is not explained), and the student is introduced to mnemonic devices for the notes (Fig. 7.1).

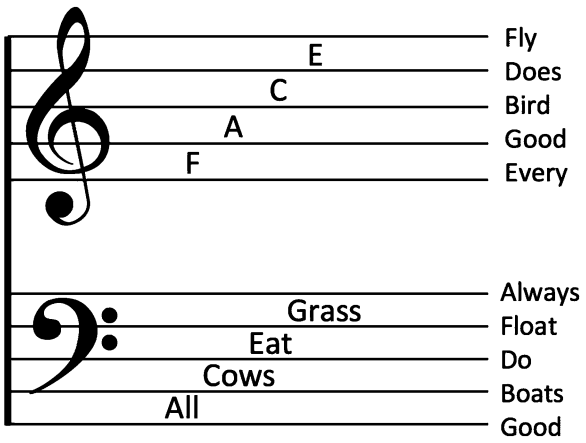

Fig. 7.1 Mnemonics

Such mnemonics are almost universal and can be helpful devices, but does a student, habituated to reading pages of text from top to bottom, find it natural to read from the bottom up? My habituated inclination is to render "all cows eat grass" as "grass eat cows all." As it happens, music is typically explained from the bottom up (spatially) because Western Art music privileges rising pitch in melodic structures, although a beginning student would not be aware of this convention.

The Creative Learner

Creative teaching (or creative textbook design) simply remains a potential until it excites a creative response from the learner. A considerable amount of research published from the 1980s to the present, stresses the importance of either active participation in the learning process, or learner creativity, which in a sense describe the same thing (e.g., Csikszentmihalyi, 1990; Jeffrey, 2006; Kaufman & Sternberg, 2010; Mayer, 2003; McIntosh, 2010; Runco, 2003a, 2003b). Recent research affirms over and again that creative agency from the learner greatly enhances the learning process, echoing Adler's declaration that, "all genuine learning is active, not passive" that it "involves the use of the mind, not just the memory" and is a "process of discovery in which the student is the main agent, not the teacher" (1982, p. 50). Jeffrey identified the key characteristics of creative learning as identical to those required for creative teaching, i.e., relevance, control, ownership, and innovation (2006, p. 5). For example, to be relevant requires that learning is meaningful to students, and that it appeal to their interest and needs, in other words, "students learn what they care about and remember what they understand" (Ericksen, 1984, p. 51).

There are several ways we could consider making music theory meaningful. One would be to provide music examples from the student's favorite repertory. This is possible in a one-on-one situation, but a little more difficult for a group of people with disparate musical tastes. Perhaps more pertinent is to consider working with, rather than against, the intrinsic high connectivity of music theory. Recognizing the highly connective nature of music theory can actually be considered an advantage since it invites the teacher or textbook designer to imaginatively create narratives out of the material. There must be a number of ways to do this, but I have discovered that tapping into the creative processes of the original inventors within a body of knowledge offers the advantage that the narrative is already in place.

A built-in feature of learning a technical subject such as music theory has to be the working of exercises. Traditionally these have been considered essential to learning music theory, and for some music textbooks the working of problems and exercises comprises the major part of the book (or computer program). There are good grounds for concentrating on exercises, as it provides opportunities for finding solutions, which is itself part of the creative process. Runco has found that "any thinking or problem solving that involves the construction of new meaning is creative" (2003a, p. 318). However, Paul Chandler and John Sweller report that conventional problem solving in certain situations can have negative learning consequences (1991, p. 294). This is particularly the case where students are not aware of the relevance of exercises. I can vouch for this, for I have experienced over and over again, students who have become adept at such tasks as recognizing and naming intervals like the "major sixth," "augmented second," and "diminished fifth," without having the faintest idea of what they sound like or how they are applied in music. To avoid such problems, Chandler and Sweller recommend to avoid relying too much on problem solving, suggesting instead that the use of worked examples is far more useful. Their results from a number of experiments using introductory instructional material combined with worked examples demonstrate that "far more emphasis should be placed on worked examples, rather than conventional problems and exercises, by mixing large numbers of integrated worked examples with conventional problems" (1991, p. 331).

Music theory pedagogy shares an advantage with some other disciplines (e.g., geography, mathematics, physics), in that it delivers its explanation, not only with verbal material (written or spoken) but also with visual material, as graphic symbols and diagrams. Music theory instruction is positioned to take advantage of what has been termed "dual channel information processing," since written music consists mostly of signs and diagrams (Mayer, 2003, p. 129). The advantage to the learner is that visual and verbal representations are processed separately because they use largely different neurological pathways. Richard Mayer in his work with dual channel processing, refers to the "multimedia effect" in which students learn more deeply from a multimedia explanation presented in words and pictures than from words alone (2003, p. 131). However, Mayer cites some caveats regarding the use of visual material. One caveat, consistent with cognitive load theory, is that "learners be able to hold corresponding visual and verbal representations in working memory at the same time." Another is a reminder that "media environments do

not cause learning," rather, "cognitive processing by the learner causes learning" (2003, p. 137). Mayer's work recommends four methods of promoting active cognitive processing "within the constraints of the human information processing system: adding pictures to words, eliminating extraneous words and pictures, placing words near corresponding pictures, and using conversational style for words" (2003, p. 137). To experience the direct opposite of this advice, one only has to try to assemble flat pack furniture armed with a booklet containing poorly constructed diagrams, with instructions (in querky syntax) embedded a few pages away from the relevant, incomprehensible, diagrams. Placing simple instructions next to diagrams in simple language can be so easily achieved in music theory textbooks or classroom instructional material.

Music theory pedagogy has an advantage over most other fields of study since in addition to verbal and visual material, given the right technology, it can also provide aural material (i.e., musical sound). In fact, learning music theory without reference to the physical material—the sound—can be a fairly useless exercise. Music textbook authors have long recognized the need to include written music examples, on the assumption that the student will play these examples at least once (although, for the student to learn to associate the written material with its sound would take many repetitions). There are two problems with this assumption, the first being that a student just coming to terms with how to recognize symbols as representative of a named pitch, (e.g., the note *c*), which has meaning in relation to other notes, probably doesn't know where to find this note on an instrument. Second, typically, books are read while sitting on a chair or sofa, while instruments are usually some distance away. Of those who could already play an instrument, how many would think (as I did as a student) to play the exercises later, while never actually getting around to it? Up until now authors of music theory texts have done the best they can with cassette tapes, CDs, CDRoms, and the like. Fortunately, much more utility is at hand in the form of the iPad in which musical examples can be embedded into the text and heard when the reader taps the screen. That sound file can be attached to a written musical example, or it may take the form of a video. The learning advantages of the student making aural, visual, and verbal connections immediately and repeatedly, if she so wishes, promise to be considerable.

A Theory Lesson: The Historical Creativity of Guido of Arezzo

At the beginning of the eleventh century, pitch was represented by small symbols (*neumes*), which indicated rhythm and the relative up-ness and down-ness of pitch—but imprecisely. Around the year 1030, the Italian Benedictine monk Guido of Arezzo (c. 995—c.1050) solved the problem of pitch imprecision. His motivation was to reduce the length of time it took for choristers to memorize the church chants from 10 years to 2, through two methods. One was the invention of what we now know as the *solfege* method in which certain syllables (ut-re-mi-fa-so-la) indicated a degree of the scale (mode). The beauty of this system is that singers

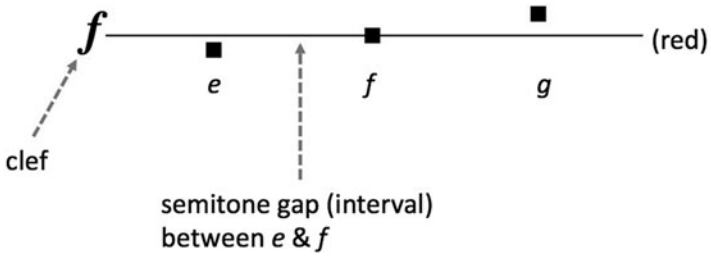

Fig. 7.2 The first clef

could easily identify the larger and smaller distances (tones and semitones) between pitches. His other invention was a written symbol—he simply added a horizontal line to the then existing notation system. This deceptively simple sign enabled relative pitch precision, and very importantly, identified the smallest distance (semitone) that was recognized as practically possible between two pitches. As a music educator he knew the importance of all singers agreeing on where the half-steps (semitones) appeared in a chant—the consequences of not finding such agreement being somewhat unharmonious (Rastall, 1983, p. 32).

Guido's first graphic symbol, a horizontal line, colored red, indicates where one of the half-steps (semitones) is found. A note written directly on the line signifies the pitch of *f,* which means that the note written directly beneath it is a half-step (semitone) lower, *e*. The letter *f* is written at the beginning of the line to indicate the pitch of *f* (becoming the first clef), while the horizontal red line becomes the first line of the staff (Fig. 7.2).[3]

This is pretty simple, but does not allow for precision beyond three notes, and neither does it allow for the fact that within a series of adjacent notes (a scale) there are usually two pairs of notes a half-note (semitone) apart. So, Guido invented another line and another clef to go with it so that both pairs of notes a half-note (semitone) apart could be identified. The second line was colored yellow to distinguish it from the red line, and the clef was called "C". The note written directly on the yellow line is the note of *c* and the note just below is *b*, a half-note (semitone) lower (Fig. 7.3). Eventually a third line was added, not to indicate a half-note (because the half-notes occur only between *b–c* and *e–f*, and they are already notated), but to increase the range of notated pitches. The clef sign in front of the black line is *G*, which indicates that a note written on that line is the pitch of *g* (Fig. 7.4).

With a staff of three lines, there are still some notes floating between the lines in an imprecise way, so more lines were added later to complete the grid. Now each note has its own place, either sitting on a line, or taking up the space between the lines (Fig. 7.5).

[3] The following "lesson" on clefs is a summary from my ebook, (2012). *Foundations for college music theory*. Sydney, Macquarie University: Lighthouse Press.

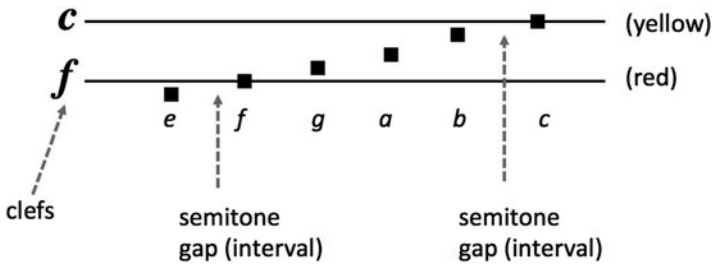

Fig. 7.3 The second clef

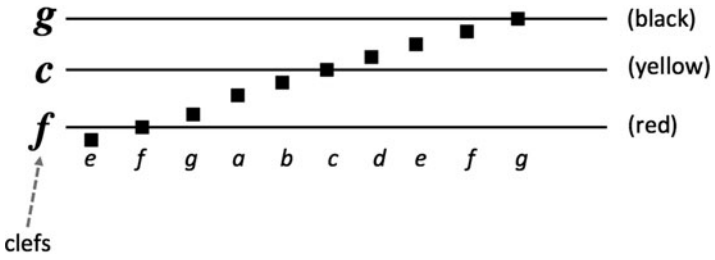

Fig. 7.4 The third clef

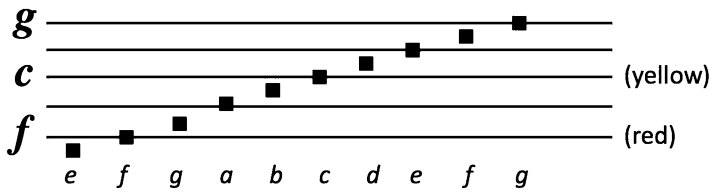

Fig. 7.5 Adding more lines to the clef

With five lines it now becomes possible to place a scale of ten notes and more on a precise grid. The two colored lines continued to notate the half-notes (semitones), but the use of color died out by the sixteenth century, partly because colored printing was too expensive, and partly because the letter names *G*, *C*, and *F* written before the lines were really all that was needed to indicate specific pitches from which all of the other pitches could be derived. These letter names became what we now call "clefs." After Guido, more and more lines were added above and below the grid (called a "staff" or "stave") to enable the writing of polyphonic music (i.e., more than one voice at a time) for four different voice types, from low to high pitch range: Bass, Tenor, Alto, Soprano (Fig. 7.6).

This led to the "grand staff," with 11 lines in it (Fig. 7.7).

With the colored lines it is possible to visually find your way around this large grid, but without the color it becomes difficult to distinguish whether a note is on

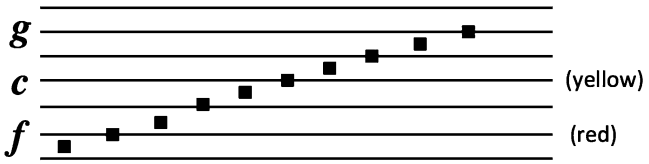

Fig. 7.6 Still more lines above and below the clefs

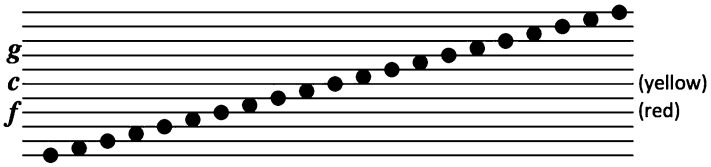

Fig. 7.7 The (old) grand staff

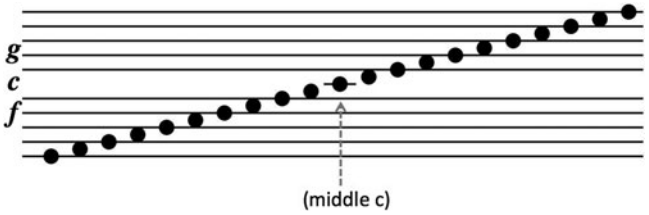

Fig. 7.8 The (new) grand staf

line six or seven, for example. So the middle line (the *c* line) was removed to allow the eye to more readily discern a specific line within the grid (Fig. 7.8).

What remains of this journey is what we are familiar with today for the piano: two staffs of five lines each, with a note *c* in between them on a little piece of a staff line (called a ledger line). The note between the two staffs has become known as "middle c," not because it is in the middle of the piano keyboard (which it is, more or less), but because it is in the middle between the two clefs. In the modern double staff, for convenience the gap has become wider between the two sets of five lines (without in any way affecting the aural meaning), so now the note of *c* gives the appearance of floating in the middle between the staves (Fig. 7.9).

We still need a way of figuring out the names of each of these lines and spaces relative to each other (and hence, the notes placed on them), so Guido's letter names of *G*, *C*, and *F* for fixing the pitches were retained, but now as symbols they have ended up looking very stylized. These stylized letters, called, "clefs" fix the pitch of one line so that all other lines (and hence, notes) relative to it are also known. The *G* clef (also known as the treble clef) on the upper staff indicates that the note on the second to bottom line is the note of *g*. The *F* clef (also known as the bass clef) on the

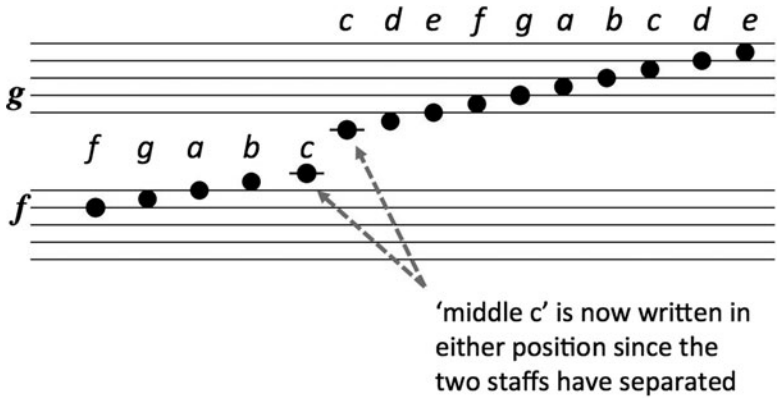

Fig. 7.9 The modern double staff

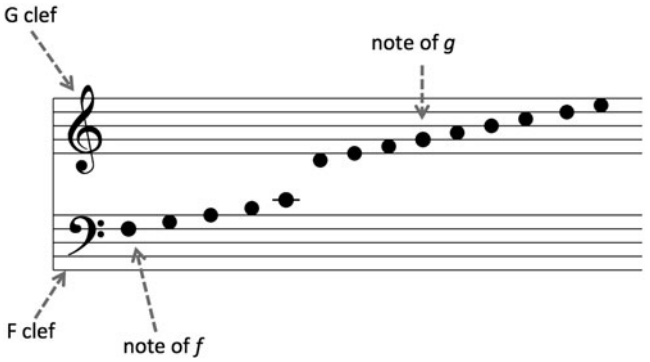

Fig. 7.10 The modern clefs

lower staff indicates that the note on the second to top line is the note of *f* (Fig. 7.10).

Guido's initial invention of staff and clef had a dramatic influence throughout Europe, with its ready adoption changing the course of music history and eventually leading to the system of multiple staves, such as those represented above. Not only was precision of notation improved enormously but also from then on music-culture no longer relied solely on memory and oral transmission, which opened up the possibilities of the creation of more complex music and easier and quicker dissemination. It also enabled the concept of the "composer" since written music would become physically separated from the composer, encouraging acknowledgment of authorship. From the moment of this very significant "big bang" in Western music history, music "belonged to its creators, not its re-creators" (Goodall, 2000, p. 33).

Ironically, at the time of his creative invention of staff and clefs, Guido d'Arezzo would not have regarded himself as a creative individual, since such attributes were not personally ascribed in the Middle Ages. Guido's innovation arose from attempts

to solve pedagogical problems, but he was unique, since then music theory was more concerned with the physical properties of sound than with sound itself, and even less so with music education as we understand it. But even though Guido would not have recognized our modern concept of creativity, we can safely apply it retrospectively to his system, so long as we realize we are doing so from our own cultural perspective. We could apply to Guido, Mark Runco's distillation of definitions of creativity, as "the production of useful new products and ideas" (2003b, p. 20). The above lesson using Guido's journey of discovery as its starting point, is a thumb-nail sketch applied to a theory lesson, but of course the historical detail has not been given here in its fullness. To do so would be too confusing for a student learning to read music, but the hope is that in this simplified form it demonstrates, for the purposes of this chapter, how incorporating some of the logic derived from creative historical moments can provide active connectivity to music rudiments that would otherwise appear unrelated and illogically conceived. By utilizing the creative processes of the inventors and developers of a systematic body of knowledge, advantage is taken of the intrinsic high connectivity of the domain. High connectivity does not need to be considered problematic, for it is possible to simplify the presentation of the facts, while at the same time utilizing the very complexity and high interactivity of the elements to allow for creative connectivity. With the additional help of a digital tool such as an iPad, a number of relatively simple and fresh approaches to the writing of music theory texts can challenge the factual objectivity approach that has been silently adopted for centuries. I have yet to scientifically test the efficacy of this work, but my personal experience in the classroom convinces me that a few small changes reap considerable reward. Applying principles of active cognitive processing while recognizing the advantages of the multimedia effect and presenting the material in a way which sensibly takes account of cognitive load theory, goes a long way toward improving music theory teaching and learning. My experience over the 5 years of developing this approach in the university arena is that in the first instance students offer resistance. They regard their music theory classes as a "pill" they have to swallow as quickly as possible in order to get on with the real stuff of playing, composing, and performing music. At first there might be cries of "do we need to know this history stuff," but such responses merely invite me to demonstrate more effectively the creative input of the inventors of music notation and to engage the students' own creative and musical faculties in the learning process. To counteract the constraint of a prescribed timeframe of three lectures a week over 12 weeks, I developed the ebook in which students could create their own study schedule and take time to experience the learning in their own way (Court, 2012). In the next iteration of the book I intend to adopt more of the highly creative journeys of not only the historical inventors but also the early educators in music notation and theory from the sixteenth century onwards, and to do so in flexible formats facilitated by the web. The encouraging feedback I have had from studying my student cohort is that what previously appeared illogical, is appreciated for its inherent logic and for the way it excites the imagination. My next step is to write an ebook (or maybe a web resource) where students are encouraged to invent their own system of notation,

with no reference to known models. This would be within an interactive learning space in which other students' inventions would be critiqued along with, in the final analysis, the historical model we use today, an approach already used in elementary education but which doesn't seem to have spread much further. Certainly, the least we owe a student who is brave enough to embark on learning a subject so shrouded in mystery, is to recognize their inherent creativity, their desire to learn and their intelligence, and to match that with our own imaginations.

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Chapter 8
New Directions in Teaching Forensic Psychology

David L. Shapiro and Lenore E. A. Walker

Introduction

Forensic Psychology or the study of psychology as it applies to legal issues, as a unique area of study, has been in existence for approximately 40 years now. Mostly applying social, developmental, and clinical psychology precepts to understanding important legal questions such as state of mind during criminal actions, ability of adolescents to be rehabilitated, or impact of social and cultural mores on battered women who kill their abusers, forensic psychologists have been of assistance to "triers of fact," that is, judges and juries in a variety of cases where psychology and law intersect. Within the parameters of this field, new areas of research and new approaches to assessment have been developed, including what are now called Forensic Assessment Instruments, which are tools that measure explicitly psycho-legal issues (i.e., competency to stand trial) and demonstrate new ways of conceptualizing the interface between psychology and the law. Specialty Guidelines for Forensic Practice have recently been revised and adopted by American Psychological Association (APA) Council of Representatives as policy to guide forensic psychologists in their practice. These guidelines, as well as the Child Custody Guidelines appear on the APA website and have been incorporated into the regulations regarding the practice of psychology in many states.

A parallel development has focused on innovative and creative ways of teaching the integration conceptually and practically of psychology and law. Students are encouraged to learn not only the basic concepts of psychology and the foundations of civil, family, and criminal law but also how to put them together into a meaningful synthesis. This requires a departure from traditional teaching methods which utilize lectures and discussions and moves to a more creative approach utilizing "real world" situations in which students actually demonstrate what they have learned in a variety

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of innovative and creative ways, such as mock trials, arguing a position to a Supreme Court played by faculty members, writing *amicus curiae* briefs discussing psychological knowledge, and analyzing a law that incorporates elements dealing with psychological development. With the current emphasis in education on demonstrating foundational and functional competencies, and methods of measuring the attainment of these competencies, the forensic program at Nova Southeastern University's Center for Psychological Studies (NSU CPS) is unique in that it utilizes a variety of techniques quite different from traditional pedagogy. The emphasis on real world applications of psychological and legal concepts, utilizing mock jurors and judges enables the measurement of how well the students have mastered the concepts and skills taught in a creative way.

One of the advantages of this approach is that laws are always changing, incorporating more and more data from the behavioral sciences, and as the laws change, so do the challenges for mental health practitioners to incorporate their understanding of the law into their daily practice. Students learn to apply their knowledge of this constantly changing judicial landscape into the way they approach clinical problems. The program therefore easily adapts to these changes by teaching the implications of new laws for clinical practice. To our knowledge, this program is very unique. It is one of the only doctoral programs that has a focus on clinical forensic psychology, i.e., the actual practice dimensions. Other programs have primarily a legal or research base and do not teach the actual skills needed to implement legal developments into clinical training.

Clinical Forensic Psychology Program

The forensic concentration at NSU CPS is a clinically oriented forensic program that is nested within both the Ph.D. and Psy.D. clinical psychology programs. It consists of 18 credit hours plus a three credit hour practicum each semester for a year. Academic courses include an introduction to the field, criminal law, family law, forensic assessment, psychological interventions in forensic settings, and special issues that rotate each year it is taught. Also required is a directed study for the Psy.D. students and a dissertation for the Ph.D. students in the field. Students graduate with a clinical psychology degree that makes them license eligible in most states along with an expertise in forensic psychology and many of them obtain psychology internships working in forensic settings. The practicum coordinates with various forensic community agencies, such as the Guardian ad-Litem program, the Legal Aid program, the Juvenile Detention Center, a local detention center for adults about to return to the community from prison and a local county jail where the students conduct a program for the women inmates who are survivors of domestic violence and other trauma awaiting trial while arrested and awaiting trial for other criminal acts. They also participate in a variety of faculty-run research projects including assessing the efficacy of the local felony mental health court, psychological aspects of battered women syndrome, determining empirical basis of a treatment program in the forensic setting, implications of psychological testimony in death penalty cases, and others.

Description of Innovative Practicum Sites

Guardian ad Litem Program

In the Guardian ad Litem program (GAL), students are asked to do evaluations of both parents and children who have been involved in dependency courts including evaluation for the possible termination of parental rights. When dealing with the children, the evaluation is done with a focus on possible trauma and recommendations for treatment. On occasion, the parents are also evaluated to see if they have successfully completed a parenting program. This is very frequently quite revealing and important for students, as they find that the parents sometimes merely go through the motions of participating in a parenting program and really do not understand the reason their parental rights are in jeopardy of being terminated. In some cases, cultural issues must be addressed, as what is termed as abuse in the United States may be standard child-raising techniques in their country of origin. In other cases, child protection workers may not understand the limitations poverty may place on parents' decision making about things their children need. The students do a full psychological assessment which includes a biopsychosocial interview, cognitive assessment using the Wechsler Adult Intelligence Scale (WAIS-IV) or the Weschler Intelligence Scale for Children (WISC-IV); personality assessment using the Personality Assessment Inventory (PAI or PAI-A), the Rorschach and several tests to evaluate trauma, usually the Trauma Symptom Inventory (TSI) and the Detailed Assessment of Posttraumatic Stress Disorder (DAPS) for adults and the Trauma Symptom Checklist for Children. (TSCC or TSCC-A). Behavioral checklists (such as the Connors or Child Behavior Check List) are given to parents, guardians, and teachers where appropriate. These tests, of course, are modified or adapted depending on the age and ability of the person being tested. In cases where cultural backgrounds are dissimilar to the standardization sample norms, students learn to report they have broken standardization where appropriate while also being very cautious in their interpretation of the results. At times, there are also questions regarding educational placement, which the students address by doing various educational and achievement tests or referring to another Nova Southeastern University Center for Psychological Studies Psychology Services Clinic.

Legal Aid Program

In the legal aid program, there is some overlap with the Guardian ad Litem program, but often an additional focus is to evaluate a child in terms of their treatment needs, again with a trauma-informed focus, since this is so often an issue and to do evaluations of the treatment programs into which these children are placed. Our students get right into the court cases using a combination of

creative and traditional psychological techniques. In the state of Florida, children have legal standing in two courts and are permitted representation by their own attorney when their parent's rights are about to be terminated and when they are about to be sent to a residential placement. As these children rarely have financial resources, they are usually represented by a legal aid attorney. The difference between a GAL and children's attorney's representation is important: the GAL must represent the child's best interests while the children's attorney must represent the child's wishes. While sometimes these are the same, more often than not, they may be different as what the child wants may not be in his or her best interests according to others involved in the case. Our students learn how to evaluate both areas and assist the court in coming to the best opinion possible in often very complex and difficult cases. For example, in one case the court was being told that legally it was in the child's best interests to be placed with a local relative while the child wished to be placed with a relative who lived out-of-state. When the child's attorney, who had the resources to make a home visit out-of-state, brought that relative to be evaluated by the student, and the reasons for the recommendation were presented to the judge, the decision became clear that the out-of-state relative was also in the child's best interests. As our services do not cost any money to those who use them, we have the benefit of time and expertise to do proper and thorough evaluations that are closer to a child's best interests than those mandated by costs and efficiency.

Juvenile Detention Center

At the Juvenile Detention Center, the students have set up several psycho-educational groups based on a format devised by Doctor Lenore Walker (Walker, 2009) that had previously been used in a program for the survivors of domestic violence called STEP (Survivor Therapy Empowerment Program). Initially these groups were adapted for use in the juvenile detention center where youth from 12 to 18 are housed for a maximum of 21 days. Thus, whatever is provided for these youth must be both short and relevant, not easy given the complexities of these youth and their previous failures in all the local systems. Motivation is a major problem although they are mandated to attend with officers guarding their outward behavior. Often 25–30 youth may be in a group at a time. Each year the students have modified the original group format and lead the sessions two to three times a week for 30 min at a time, usually between the end of their school classes and beginning of dinner and evening activities. They have included more relevant information and life skills for the youth and renamed the groups as "Girl Talk" for the girls, "Boy Talk" for the boys, and "Juvenile Anger Reduction Treatment" or JART for the older boys. Each session adopts creative ways to teach the life skills in the program using topics of interest for their age group including music and relevant job skills for boys and some arts and teen topics for girls. A manual with options from which to choose is available for the student facilitators. The officers

have become interested in the skills being taught and from time to time become participants in the program which makes their role easier when supervising these juveniles. There is also an attempt to set up an assessment program within the juvenile detention center but red tape from the state has delayed the start of it at this time. Nonetheless, the combination of counselors from the local mental health center and the doctoral students from NSU CPS won an award this year for outstanding service to the community by providing these services and saving the county money since the youth there have had no need to be hospitalized for crisis intervention since we have been providing service.

Mental Health Unit in Jail

At the Palm Beach County Detention Center, the students learn to utilize a wide range of psychological assessments and interventions, focused on brief assessments and brief interventions because of the very short-term nature typical of a jail program where inmates are in and out due to court appearances, bond releases, or other requirements of such temporary programs. Here, inmates with serious mental health problems noted upon arrest or while in detention are placed in the special mental health unit where they are able to receive these services closely supervised by doctoral level psychologists employed by the jail. Inmates are very frequently transferred out of the program in a short time, so again, interventions must be short and each contact stands on its own, since students and inmates never know when they will be transferred or released. Learning to be useful in this unusual setting is a cornerstone of the psychological treatment that is utilized in most forensic settings except for prisons where inmates are sentenced for certain periods of time.

STEP Program in Jail

Finally, as noted above, the STEP program operates within the Broward county jail in a special unit devised for women who have survived domestic violence and are also charged with crimes. These groups follow the psycho-educational model noted before. Each of twelve units that might be utilized for three months or more in an out-patient setting must stand on its own as inmates come and go depending on legal hearings or other obligations that may not permit them to attend the weekly 2-h morning program. As the jail rules require the STEP program to permit any inmate who volunteers to attend the group, it is possible to have 25–40 women show up. As is true in many jails, the facilities do not lend themselves to privacy in large group spaces, so we train the facilitators to be creative in how they deal with self-disclosures in a captive situation. Therefore, three to four students co-facilitate groups two to three mornings per week, each in a different unit. Again, each session stands on its own as inmates may begin anywhere in the cycle, skip a session where

necessary, and return a week or two later. Students must learn how to get along with each other and integrate the didactic process and skill training parts of each session with the women who attend in a creative way to hold their attention and keep one person from dominating the large group.

These STEP program sessions have been empirically validated using the Beck Anxiety and Beck Depression tests, a self-report satisfaction at the end of each week, the Trauma Symptom Inventory, and Detailed Assessment of Posttraumatic Stress administered by the students after the sessions dealing with symptoms. Results are shared with those women who wish to see them, although it is interesting that many do not want to know their scores, fearing there is nothing they can do while awaiting trial. Many of these women also have substance abuse problems and are trying to learn better ways to cope with their lives than go back to their nonproductive ways. This program in a corrections facility is an innovative psychological intervention that is not only quite psychotherapy but also beyond just psycho-education. Some of the participants also play a part in the battered women research conducted by students in the jail, which helps in training the difference between psychological assessments for clinical use and those for research purposes.

We have found that the students who participate in these programs not only need the academic learning, which they can obtain from books and journal articles but also have a need to learn and practice specific skills that can be developed in a more experiential and creative way. The experiential approach is begun within the very first year, usually with administration of research instruments. By the second year, students are assigned to 15 hours per week of practical experiences with 1 hour per week supervision at the site and 1 hour in intensive supervision by clinical faculty. During their third year they spend 20 hours per week in their practicum sites with the same level of supervision. One of those years the forensic concentration students spend in the forensic practicum sites and are supervised by the forensic faculty including a weekly 2-hour skill-building seminar. Those who select the forensic concentration also learn to apply social justice concepts when working with people who are both mentally ill and accused of a crime. The issue of assigning criminal responsibility is too broad to discuss here, but it is an important element that often finds its way into the forensic evaluators' work despite the attempt to train them in objectivity. Although our legal system has provisions to excuse the mentally ill from criminal responsibility, there is a balance with public safety. Observing and participating within the criminal justice system under supervision helps shape these values and ethics in the students for their independent practices later.

Description of Innovative Techniques in Clinical Courses

Ethics and Professional Issues

While this course deals in general with ethical and professional issues, it also has a heavy emphasis on forensic issues, dealing not only with the current Code of Ethics

(including the 2010 modifications) but also with the current version of the Specialty Guidelines for Forensic Psychologists. Students sign up to join various groups and select a section either of the APA. Ethics Code or of the current Specialty Guidelines for Forensic Psychologists. Each group then is left free to present a skit or a scenario illustrating such issues as advertising, conflict over multiple relationships, proper and improper assessment, and proper and improper therapy techniques. Several of these approaches have been quite creative. For instance, one group put on an extensive video, which was also posted on YouTube, of an instrument which, when placed on one's head, enhanced memory function. The students involved named this creative new device "the Zodia Chrome Memory Enhancer." Others circulated advertisements of a psychologist who claimed to have expertise in virtually all areas. Another example of an activity in this class was of a supervisory session in which a trainee was relating to his supervisor his belief that a particular client, whom he had evaluated, was very psychotic when, in fact, the symptoms reported by that client were part of the cultural background of that individual. The students then will ask questions of the rest of the group based on their presentation, which leads to a lively discussion of the ethical standards involved. The students then are encouraged to integrate these presentations with cases in the "real world" dealing with contemporary issues, such as sexual abuse and misrepresentation of credentials.

Forensic Assessment

In this course, the students initially review two approaches to forensic assessment. First, they will review the forensic applications of traditional clinical instruments, such as the Wechsler scales, the Minnesota Multiphasic Personality Inventory, second edition (MMPI-2), the Personality Assessment Inventory, the Rorschach Inkblot Test, and various instruments used to assess trauma (e.g., Trauma Symptom Inventory, Detailed Assessment of Post Traumatic Stress). The students learn the validation studies behind these particular instruments and their proper use, as well as their misuse, within forensic settings. They then review specific forensic assessment instruments, such as the Grisso instruments for the assessment and appreciation of Miranda rights, the MacArthur Competency Assessment Tool for Criminal Adjudication, the Rogers Criminal Responsibility Assessment Scales, and a variety of assessment instruments dealing with violence risk and with malingering. In each of these, once again, students are urged to explore the validity and reliability of each assessment instrument.

The mid-term examination provides them with an actual assessment done by a psychologist in the community of the competency and criminal responsibility of a given defendant. The assessment is deliberately chosen because it is an inadequate assessment and the students are asked to critique the assessment, describing what is proper and what is improper for a forensic assessment technique. The final examination in the course consists of the students selecting a given instrument, presenting it to the class from the point of view of validation, reliability and test construction,

and then defending it against cross-examination questions prepared by the instructor and by the rest of the class.

Forensic Psychology: Criminal Law

In this course, students review the case law in major areas such as competency to stand trial, criminal responsibility, assessment of violent behavior, capital punishment and sexually violent predator evaluations. The class is provided with a complete description of an actual case with all background data, police reports, witness statements, psychological test data, and transcripts of hearings. The students will then pick roles as prosecutors, defense attorneys, and expert witnesses for the defense and for the prosecution. The respective experts and the attorneys will spend several class periods putting together a complete trial strategy. The instructor will move from group to group, helping them plan this strategy. One of the instructors then serves as a judge and presides over a mock trial held in the courtroom in the nearby NSU law school building. This experience becomes very real as one of the students will call out "Hear Ye, Hear Ye, Circuit Court for the County of Nova is now in session. Draw nigh and give your attention. God save this honorable Court, and the County of Nova." The other instructor then serves as "floating counsel" and will advise each of the students who are playing the roles of attorneys as to proper trial strategies and questions to ask. On occasion, the "floating" faculty member will ask questions as well. There will be objections and ruling on objections by the instructor who plays the role of a judge. The remaining students, since not all can participate as expert witnesses or attorneys, serve as jurors and must write a paper detailing their deliberations. Interestingly, pictures taken by the NSU marketing team during a rehearsal are used in brochures for the CPS programs.

Special Issues in Forensic Psychology

The syllabus for this class varies, depending on the semester, and generally deals with an analysis and presentation of ongoing cases in the media or decisions in the US Supreme Court that impact on psychologists' scope of practice in the courts. One of the most effective learning instruments here is to have students take a particular case and present legal arguments before a mock Supreme Court. Several students will play the parts of appellate defense attorneys and others will play the roles of attorney generals, presenting the legal issues before the US Supreme Court involving various mental health arguments. The instructor will play the role of US Supreme Court justices, raising various legal issues. As an example, in a recent class, the students needed to brief and present arguments in the case of *Panetti v. Quaterman*. This case dealt with the level of competency necessary for capital

sentencing proceedings. That is, the students playing attorneys general argued that a factual understanding of the reasons for execution was sufficient to find a defendant competent to be executed. The defense attorneys played by other students argued for a more lengthy and involved approach to the competency issue, indicating that a true rational understanding needs to be elicited in order to find a defendant competent. Another example of activity in this class is seen in a detailed breakdown of several capital punishment cases in which students reviewed transcripts of actual testimony as well as critique and devise cross-examination questions for the experts who have testified. For instance, a spirited cross-examination emerged for an expert who stated that he was able to predict future violent behavior with 100 % accuracy without even seeing the defendant, basing his opinion on hypothetical questions posed by the prosecution. There were also some very compelling questions developed by the students for an expert who based his prediction of future danger on the defendant's apparent lack of remorse, which, in turn, led to a conclusion that the defendant was sociopathic (a psychopath) which, in turn, led to a conclusion that he would pose a future danger. Often, the APA submits an Amicus Brief in some of these cases, so students learn another way that psychology can be of assistance in helping resolve legal issues.

Forensic Psychology and Family Law

Students are asked to work in groups to put together a presentation on a topic in family law involving psychological issues that we have covered during the semester. Their choices are (1) mock trial in a custody case, (2) presenting evidence at a hearing to terminate parental rights, (3) need for family members working together to solve a problem like on a television game show, or (4) demonstration of a mediation session.

Perhaps the most creative of the presentations during one semester was the group that chose to do a game show between two groups of feuding family members around the inheritance of the family business. Each "side" hired a psychologist and a lawyer, who together with themselves had to make the case that they were the deserving members whom the dead father wanted to inherit the business. They used the laws and the psychological principles that favored their side. The rest of the class served as the jury, awarding the points for the various issues discussed. The legal issue here was that the man died *intestate*, that is, without a will appointing a successor. One son was his assistant in the business and one was off doing his own thing, living off of his trust account. However, the psychologist for the man with the trust fund was able to demonstrate that the father never let the other son make any decisions on his own and, therefore, proved this was evidence that he did not trust that son to run the business. The psychologist for the son, who was in business, demonstrated test data that showed the man's capabilities and blamed the father for his controlling behavior. The rest of the class, serving as the jury, deliberated and voted for the successor. Each semester, their choices have gone back and forth

between the two sons, demonstrating the difficulty in using posthumous methods to make these difficult decisions.

Another runner up was a presentation on reproductive rights, where a psychologist had to assist each client (the two parents) on the distribution of the frozen fertilized during the divorce. During the marriage when the couple needed IVF procedures to conceive their first child, additional ova and sperm were taken, fertilized into gametes, in anticipation of future children. The side with the most compelling argument of hardship, should the gametes be destroyed, usually will win these cases legally. Therefore, different psychological arguments needed to be made without making the person with the worst hardship incapable of raising the couple's other children. For example, one year the selected case was determined with the gametes awarded to the man because he had testicular cancer and no longer could retrieve sperm, while in another year the gametes were awarded to the woman because it was more invasive to obtain more ova than more sperm. Of course, since both former spouses will have to support the resulting child as in a typical divorce, it also may be considered a financial hardship. In another year, the man died, and the surviving woman and the man's children from an earlier marriage fought over the frozen gametes. Naturally, the children's interests were not to have to share their father's estate with another yet unborn child, while the wife's interests were not to lose the ability to have her dead husband's child. In that case, the wife won as the man's contributions to the frozen gamete assumed his wishes to have another child. However, the psychologist player made a good argument that the wife tricked him into contributing his semen, having admitted that she obtained it from a condom after they had had sex. The students assigned to this case agreed that this type of learning is quite innovative and exciting.

Integrated Report Class

While this class is given to both forensic and non-forensic students, it has a great deal of application within the forensic setting, since even standardized psychological tests are frequently attacked in Court as unreliable and invalid. Ways of defending them are discussed in the class. This class is mandatory for all Psy.D. candidates for their third year of doctoral study after completing all testing courses and one full year of practicum. To date the cases used are put up on WebCT platform so that students and faculty can use them on the computer. Since BlackBoard will be the new platform, opportunities will arise to set up avatars to help creatively make the cases more meaningful than just the test protocols.

To teach the class, instructors take complete test batteries (cognitive, personality, trauma, and other tests) and present them one test at a time to help the class understand the concepts of what they are assessing for and how that particular test measures them. We start with interview data and put together a list of hypotheses concerning diagnoses that may be associated with the client based on the presenting

data. Students then write up the procedure and relevant history using several outlines presented and submit it for grading.

We then move on to the next section of the course, "Findings" that are based on the data used by the examiner. We begin with cognitive data, usually from the WISC (Wechsler Intelligence Scales for Children), or WAIS (Wechsler Adult Intelligence Scale), sometimes from the WMS (Wechsler Memory Scale) or RBANS (Repeatable Battery for the Assessment of Neuropsychological Status) and continue to explore hypotheses: crossing out ones that do not fit and adding those that we did not think about before. We spend several classes going over concepts like fluid intelligence, crystallized intelligence, and how they are measured in each subtest and what it means for the particular client. We try to get them to think about the cognitive skills they are assessing rather than the subtest scores themselves. If there are possible neuropsychological and forensic issues, we add the interpretation from some specific tests. We may act out the issues that the tests raise with the students during class discussions. Students then write up a paragraph or two about the cognitive issues, integrating them with what was learned in the client's history and are graded according to rubrics prepared. They are then given the opportunity to revise their on-going written report after the feedback from the teacher and a teaching assistant who is assigned to the class.

We then move on to personality tests and use a case with at least the Personality Assessment Inventory (PAI) or the Minnesota Multiphasic Personality Inventory (MMPI) as an objective test and the Rorschach with Exner Scoring as a more subjective test as these tests are in the typical psychological test battery. As students do not get to administer and score many of these tests in their earlier assessment classes, we spend time on these areas as well as interpretation. Sometimes we also add other tests if available. We look at the emotional components that each test measures and how the personality tests agree or disagree with one another as well as how they are congruent or incongruent with the cognitive test hypotheses. We continue to draw on prior knowledge of the signs and symptoms of the major mental disorders. Again, sometimes we role-play or act out what it might look like for a particular client to have the symptoms being highlighted by the tests.

We may also use videos or movies to illustrate certain characteristics as all our classrooms are outfitted with audiovisual capabilities including access to streaming videos purchased by our library. For the next graded assignment, students are required to go back and change what they wrote before, to conform to what these additional tests tell them about the client. This is very important within a forensic context because in cross-examination, attorneys may try to pull material out of context; this process of hypotheses testing and refinement is precisely the way to demonstrate under cross-examination that it is an integrative process and that the pulling of material out of context is not what is being done in an integrative assessment.

Finally, we check out what types of trauma the client may have told us in the history and how they might manifest themselves given the other findings on the cognitive and emotional tests. Non-forensic students may not have learned the TSI or DAPS so we go over them again in class. Again, we use the diagnostic criteria to

help us focus on integrating the various test findings. Students go back, adjust their reports to reflect what the additional information tells them, and submit their draft reports again for grading.

To complete the creative exercise, the students are required to write a discussion section that integrates all of the data together in several paragraphs, a conclusion section that summarizes the findings and any recommendations, if possible. They complete this assignment piece by piece, putting together the report like a picture puzzle, with one or two more cases, depending on the time frame and complexity of the cases.

The final examination consists of the students themselves administering the standard clinical interview, mental status examination, cognitive, personality and trauma tests, as well as others (some do learning disability tests, others use neuropsychological tests) to a client (preferably) and write an integrated report and present it to the class using PowerPoint software and test results. The oral presentation gives them practice in selecting the relevant areas that they will have to do during their Clinical Competency Examination later on during the end of their third year to qualify to be eligible to apply for an internship the following year.

Introduction to Forensic Psychology

In this course we survey the variety of types of cases and skills needed for the forensic psychologist to give the students a general overview of the field based on the Walker and Shapiro (2004) text. As these types of survey courses can get boring, creative methods keep the students' interests and focus on the academic information they need to learn. In this course, students are introduced to legal research and the law library to learn their tools by the law librarian. Using the computer lab, students learn to access Lexis Nexis, WestLaw, and other relevant databases, and learn how to shepardize cases or look up the history of case laws in various topic areas that we survey in the course. The writing assignment that they are given is to find five articles on a particular topic area and a law review article, review them, and write a short summary of their relevance in psychology. Using a rubric to measure outcomes, this provides a creative approach to assess their ability to do the research, analyze and synthesize the psychological principles used in developing case law, and write up their findings.

Later in the course, we focus on the APA Amicus Brief program whereby APA provides relevant psychological research summaries on important social or clinical psychology topics that are being debated usually in the US Supreme Court (USSC). This past semester we reviewed three cases dealing with the question of whether juveniles, who have been waived into adult court due to serious crimes committed, should be punished with the death penalty or with life without parole. The three Amicus Briefs, which were provided by APA to the 2012 USSC in a case called *US v Miller* that was argued before the USSC, presented relevant social psychological research on the difference between youth and adult understanding of risk factors,

relevant biological findings on the lack of brain development in teens and its consequences on impulsive behavior, and other developmental and clinical issues. The final assignment was to review the APA Amicus Briefs and USSC decisions in the two prior cases (*Roper* and *Graham*) and with the three APA Amicus Briefs in mind, choose one of the nine USSC Justices and write the decision in *Miller* as if you were that USSC Justice. This was a far more creative way of assessing if the students were able to understand the psychological research and its application to the decision facing the Court. A rubric was provided along with the assignment to guide students in what was required to get a particular grade on their paper.

Online Course on Gender Violence in the Ph.D. in Criminal Justice Program

This course has all of its Power Point and reading assignments already posted on the platform before the semester begins so students can follow along with the class week by week. A minimum of two-times-a-week discussion topics are posted on what is called the discussion board in which students are required to participate, and once a week a live "chat" takes place with students and the professor and/or teaching assistant who type the discussion during the chat with each other. The instructor can also use tools that activate voices and in some cases Skype-like transmissions with videos and voices. One of the most important things to look for when teaching this course is what is relevant to the topic in the news. This past semester, students gained a great deal of additional information as they analyzed and integrated with the course current events such as the Penn State football scandal on child abuse, the charges against World Bank Chair Dominic Strauss-Kahn, Hillary Clinton's speech to the United Nations UNICEF nations in Brussels on gay rights as human rights and the relationship of Alec Baldwin's behavior toward the American Airlines flight attendant to his prior convictions on domestic violence. We also use YouTube clips to illustrate some of the behavior that they are learning about, some of which are provided by students and posted as their contribution on discussion boards. As we migrate to BlackBoard, we will begin to use avatars to design our own examples and have access to books, articles, and the internet sites to further develop the course. These tools are of enormous assistance in capturing the attention of students who need to get beyond the defenses created by their own emotional feelings about gender violence issues to better understand them in an academic manner. Here creativity coupled together with research can overcome the tendency to personalize and get beyond it to generalize what the data tells us.

Although a different kind of relationship with students works online than with face-to-face with a professor, you actually can form a very close bond with them through the several time weekly contacts. Learning appears to be maximized when

there is both face-to-face and on-line projects but our online doctoral program in criminal justice accepts students from all over the world, so face-to-face is voluntary and takes place in optional research or clinical professional weekends on campus. The chats are personalized by offering some time for catching up with each other weekly and then moving into more academic issues around the weekly topic. When teaching the gender violence course, it is expected that some of the students will have experienced child abuse or domestic violence and maybe sexual assault, so time is needed for the personalization, but it must be brought back to what the literature says about the topic so it does not become a therapy session. Selection of interesting and relevant readings helps keep the primary focus on the academic material. Short video clips also help illustrate and help generalize the topic area. Students often find that while on the chat they manage more than one computer program at a time, which is beyond many older generation professors like ourselves. A good sense of humor is important but the line must be drawn between sexist humor (always a way for men to reduce anxiety when studying this topic area) and what is really funny. Careful management of the chats and praying for competent technology make the class a really special one.

Conclusions

We have demonstrated a number of innovative and creative ways of teaching forensic psychology to graduate students. These approaches depart dramatically from the traditional lecture, discussion, and written examination format, which often teaches facts, but gives little opportunity to use that factual learning in real situations. Our teaching model is "real world" teaching to students the skills they need to utilize effectively the psycho-legal knowledge they have gained. We have illustrated the use of these concepts in a number of courses. We intend to extend this experiential approach to the new programs we are developing.

We are starting an on-line M.S. in Forensic Psychology Program in the Fall of 2012 with 36 credits on-line, three of which may be a research thesis or an approved field experience for lawyers and mental health clinicians, disaster and crisis workers, and those who work in the corrections field. Professors are being trained to develop rubrics for learning outcomes and competency so that they can assess the success of their courses. Each rubric specifies a number of foundational and functional competencies relevant to that course, and then assigns a score from one to four depending on the student's mastery of that competence. For example, in the Ethics course described above, one of the functional competencies might be "the ability to integrate legal and ethical concepts." A score of four might represent "well developed ability to integrate legal and ethical concepts;" a score of three might represent"knowledge of legal and ethical concepts, but not able to effectively

integrate them;" a score of two represents "knowledge of legal or ethical concepts but no evidence of attempt to integrate them;" finally, a score of one would indicate "no mastery of legal or ethical concepts." Once these grading guidelines are in place, professors can be more innovative in teaching and assessing their subject areas rather than using the traditional lecture and midterm and final examination methods. Although these competency rubrics seem burdensome initially, the resulting freedom makes both teaching and learning exciting and fun. Students as well as instructors will be given these rubrics in advance of the course, so they can understand what is expected of them and how it will be measured.

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Part III
Teaching Creativity

Chapter 9
Creative Ideas for Actualizing Student Potential

Apara Ranjan and Liane Gabora

Human creativity is a multifaceted phenomenon with cognitive, attitudinal, practical, socio-cultural, economic, and environmental aspects (Plucker & Runco, 1999). It can be challenging to incorporate creativity in classrooms (Kampylis, 2008). Teachers tend to inhibit creativity by focusing on correct responses, reproduction of knowledge, and obedience and passivity in class (Alencar, 2002). Right answers, after all, tend to be easier to evaluate than creative ones. Teaching in such a way as to discourage creative answers and approaches may lead to higher scores on standardized tests (with all the sociological, marketplace, and political consequences that entails). Teachers claim to value creativity, but to hold negative attitudes toward, and show little tolerance of, attributes associated with creativity, such as risk taking, impulsivity, and independence (Beghetto, 2006; Fasko, 2001; Runco, 2003; Westby & Dawson, 1995). The majority of teachers express the fear that encouraging creativity in the classroom could lead to chaos (Aljughaiman & Mowrer-Reynolds, 2005; Beghetto, 2007; Westby & Dawson, 1995). When teachers do make efforts to encourage creativity, it is often the case that neither teacher nor students know what the expectations are. Moreover, students fear that they will be critically judged if they produce something in which they have invested at a personal level.

Despite the potentially threatening aspects of encouraging creative classrooms, we believe that no other investment in education could be more important and potentially rewarding. Both the words *student* and the word *creativity* often go hand-in-hand with the word *potential*, i.e., *student potential* and *creative potential*. The phrase *creative potential* is generally used to refer to how likely a given individual is to manifest creative works in the future, as assessed by their scores on various creativity tests. The concept of potentiality and its relationship to actuality and context has been studied in depth by physicists. In this chapter, we

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explore how the physical conception of potentiality can shed light on the notion of potential as it applies in the classroom, and in particular, on how we conceive of students' creative potential. We then discuss methods of actualizing the creative potential of students.

Potentiality

Physicists refer to an entity that is in a full state of potentiality as being in its *ground state*. The concept is broadly applicable to entities that could unfold different ways or manifest themselves differently under different contexts or in different environments or situations. In physics, this is the state an entity is in when it is not being measured, because the process of performing the measurement can affect the state of the entity.

The basic notion of ground state has been applied in cognitive psychology, specifically to the study of concepts. Concepts, such as DOG or BEAUTY, are very chameleon-like things, in that they are highly affected by context. Normally, for example, we would think that "surrounded by water" is a defining feature of the concept ISLAND, but if you use the phrase KITCHEN ISLAND, then hopefully you are not referring to something that is surrounded by water! The concept ISLAND thus can instantly shift to a state in which even a seemingly defining property of islands is not present or expected. The *ground state of a concept* is the state it is in when you are not thinking about it at all, and thus it is not affected by any context (see Aerts, Broekaert & Gabora, 2011; Aerts & Gabora, 2005; Gabora & Aerts, 2002; Gabora, Rosch, & Aerts, 2008). A minute ago you were not thinking about a giraffe, and thus your concept GIRAFFE could be said to have been in its ground state. Now you are thinking about giraffes, but it is in the context of reading this book, and so the concept is unavoidably colored by the context of encountering it while reading this book. When concepts interact with contexts there is always the possibility of new emergent properties that could not be predicted in a straightforward logical way from knowledge of the concept or the context.

We believe that this notion of potentiality applies to the student. Each student can be viewed as a wellspring of potentiality, and the teacher's responsibility is to help this potentiality to actualize or take shape in the context of the classroom environment. This potentiality-driven *perspective* on teaching leads to a different *way* of teaching. When teachers interact with students there is always the possibility of new emergent outcomes that could not be predicted in a straightforward logical way from knowledge of the teacher, the student, or the lesson plan. The thoughts and ideas of the student as he or she interacts with a particular lesson and approach to teaching it can potentially follow new, creative trajectories of which the teacher cannot conceive.

Issues

We begin by discussing some basic issues surrounding the incorporation of creativity in the classroom. *In order to actualize students' potential in classrooms, we it is important to investigate what factors that might hinder the creative potential of the student in a classroom setting.*

Expectations

The term "creativity" is often used without explanation and without establishing clear expectations (Kampylis, 2008). Lack of clear directions can effect a teacher's ability to actualize student potential, both positively and negatively (Beghetto, 2006; Runco, Johnson, & Bear, 1993). Teachers may benefit from input from psychological research on creativity as they seek to encourage creativity in their classes. Outputs are generally deemed creative if they are original, meaningful, useful or task appropriate, and potentially, possess aesthetic qualities as well (Barron, 1955; Sternberg, Kaufman, & Pretz, 2002). Specifying what kinds of creative outcomes are hoped for, or possible, can help teachers avoid dead-ends, and bewilderment on the part of students. Moreover, creative processes yield not only tangible external outputs but also internal transformative outcomes, including not just enhanced understanding of the creative domain, but enhanced understanding and acceptance, and more generally, confidence, sense of identity, and personal meaning.

Flexibility and Choice

One simple way of encouraging creativity in the classroom is to conceive of the students not as receptacles for knowledge but as entities that are biologically predisposed to (amongst other things) assimilate knowledge, frame it in their own terms, and later, do something with it. Students do not just want facts; they want facts that fill in gaps, and that may even prompt a cascade of new understandings resulting in more coherent or insightful web of understandings. Teachers can help foster this by flexibly adapting their lesson plans to the interests and perspectives of the particular individuals in the classroom, and to spontaneous events that take place in the classroom, or current affairs in the news. This can turn learning into a fun and memorable experience.

Another simple way of encouraging creativity in the classroom is to give students choice. For example, instead of providing an essay topic, one can invite students to choose a topic related to a general subject. Or, one can offer a selection of possible tasks, to be completed in any order, with the option of focusing exclusively on the task that captures greatest interest. Approaches such as these invite opportunities for students to discover where their unique interests and talents lie. For example, for an

assignment in a Psychology of Creativity class, students are given a choice between working on a project or an essay. The instructions are as follows:

Details Concerning Presentation, Essay, or Project

Choose and prepare *either* (1) a presentation, (2) an essay, or (3) a project. To help you choose and research a topic, check out 'Creativity Resources on the Web' and 'Downloadable Papers on Creativity' under 'Student Resources' on Vista. Please type assignments double-spaced, 12-point font, and use APA (American Psychological Association) format for references (examples available under 'Student Resources' on WEB-CT). Assignments MUST be grammatically correct, and will be assessed for content, accuracy, clarity, originality, and strength of arguments. *Essays and projects are due last class before start of class.*

Presentations are done individually or with a partner. Possible topics are listed on WEB-CT or you may choose a chapter of the textbook that we are not covering in class, or your own topic so long as it is relevant to creativity. *All students in the group should arrange to discuss plans with me two weeks prior to the week of their presentation,* and *must be approved by me the week prior*. Creative presentations are encouraged. Have fun with it, and make it fun for the class! (If you do a presentation, you are not obliged **to** turn anything written except the one sentence summary and the one page outline, but if it is in powerpoint please email me the .ppt file.)

An essay can be (1) a critical evaluation of at least two papers on a topic related to creativity that discusses the merits of different techniques, perspectives, or approaches. The papers can be obtained from the resources made available on *Vista*, or they can be articles in a peer-reviewed journal that you find using PSYC-info or Google Scholar. *Or* the essay can be (2) an explanation of how something learned in class applies to or sheds light on your own creative activities. It should be approximately 2000 words (approximately eight pages) not including references.

A project can be anything you want so long as it shows in a nontrivial way that you learned something about creativity in this class. Important: it is not adequate that the project simply *is* creative (e.g. a set of paintings or poems or a scrapbook). It has to demonstrate principles of the psychology of creativity. If you have any uncertainties, come talk to the TA or the Professor early in the semester about possible paper and project ideas.

This assignment is always given on the first day of class, and the final essay or project is due on the last day of class. More detailed instructions are provided in the second class of the semester. These more detailed instructions are provided in Appendix A. During that second class, a list of possible essay and project topics is provided, alongside a list of websites devoted to a multitude of creativity-related topics. Some students who have taken the course in previous years have left behind rather impressive projects that they allow us to show to students as examples of how a project can be tackled.

Assignments such as these are open-ended, and some students may feel lost at first. However, if a student has difficulty coming up with an essay or project topic, he or she can be encouraged to discuss it with the professor during office hours. In our experience, all students eventually find a topic that engages them. Another way to help students respond to the open-ended nature of the assignment is to distribute it in sections. For example, the assignment we used in our class was staggered into three phases: (1) provide title, one sentence, and one reference, (2) expand the sentence into a full page, and (3) provide the complete essay or project (and if it is a presentation, we go over the presentation with them, and the best ones present it for the class).

Assignments with this kind of inherent ambiguity encourage students to relate to distant concepts and examine ideas from new perspectives. Studies on conceptual combinations show that dissimilar concepts lead to more creative interpretations (Wilkenfeld & Ward, 2001), suggesting that ambiguous tasks, which might yield more opportunities to connect dissimilar concepts, may produce more creative results. Such an approach encourages bisociation, in which previously unrelated levels of experience or frames of references are suddenly connected (Koestler, 1964). Similarly, when students are allowed to choose a topic, they may forge connections between what they are learning and seemingly unrelated ideas or activities that they find personally meaningful.

Time-Related Factors

Creating an environment that is conducive to playing, experimenting, trying new things, and thinking things out creatively from new and unusual perspectives, is not readily compatible with a highly structured schedule and strict sets of expectations and goals. Thinking out a creative idea can take time. There are strong neurobiological (Gabora, 2010), experimental (Gabora, 2010; Gabora & Saab, 2011; Gabora, O'Connor & Ranjan, in press), and theoretical (Gabora, 2005) reasons to believe that the generation stage of creative thinking may be divergent not in that it moves in multiple directions or generates multiple possibilities, but in the sense that it produces a raw idea that is vague or unfocused, and that requires further processing to become viable. Similarly, the later stages of creative thinking may be convergent, not in the sense that an idea is selected from amongst alternatives, but in the sense that a vague idea is considered from different perspectives until it comes into focus. In other words, the terms *divergent* and *convergent* may be applicable to creative thought in the sense of shifting between well-defined and ill-defined processing modes. Moreover, it is widely believed that creativity involves shifting back and forth along a spectrum between divergent or associative and convergent or analytic modes of thought, depending on the nature of the problem or task, and the stage one is at of solving or completing it [evidence reviewed in Gabora (2010); see also Gabora and Ranjan (2012)].

A half-baked idea might result when two or more items encoded in overlapping distributions of neural cell assemblies interfere with each other and get evoked simultaneously. This has been referred to as *creative interference* because it can lead to creative ideation (Gabora, 2010). When an idea emerges through creative interference, the contributing items are not searched or selected amongst because together they form a single structure. This structure is said to be in a state of potentiality because its ill-defined elements could take on different values depending on how the idea unfolds. This unfolding involves disentangling the relevant features from the irrelevant features by observing how the idea looks from sequentially considered perspectives. In other words, one observes how it

interacts with various contexts, either internally generated (think it through) or externally generated (try it out).

The implication of this from an educational standpoint is that to allow "half-baked" ideas to actualize into a final creative product that they can feel happy with and proud of, students need sufficient time (Goleman, Kaufman, & Ray, 1992). People do not perform well on creative thinking tasks in time-pressured situations. An added benefit of providing sufficient time for creative thinking is that students may put more of themselves into the projects they undertake, and become more intrinsically motivated to complete them (see Amabile, 1983, 1988, 1990; Deci, 1975; Deci, 1981; Deci & Ryan, 1985).

A practical way for providing students with opportunities for their ideas to mature and their creative potential to be realized is to give them projects that involve multiple steps or phases and stagger feedback across these multiple phases. This lets students incubate an idea, or "sleep on it." For example, one effective means we have found for doing this involves breaking the project or essay assignment mentioned above into three phases. The instructions for completing the first phase are as follows:

Assignment 1

State whether you will be doing an essay, project, or presentation. Give the title of it, one sentence describing it, and one scholarly journal reference that you will use to research it. It should be grammatically correct and free of spelling errors. You must include at a minimum one reference to a recent (year 2000 or later) scholarly journal article in APA style.

Submit it through dropbox (do not include an attachment).

Example of How to do Assignment 1:

PSYO 317
Assignment 1
Due: September 10, 2011
Jane Sunbeam
Student Number 1111111

Essay

Title:
Neanderthal Creativity

Sentence:
This essay will discuss evidence of playfulness and artistry in artifacts found in Neanderthal settlements, and it will address the question of whether creative abilities once thought to be uniquely human can be attributed to the Neanderthals.

Reference:
Fitch, W. T. (2006). The biology and evolution of music: A comparative perspective. *Cognition, 100,* 173–215.

Creativity thrives in situations that involve a combination of freedom and constraint. We find that, for relatively unstructured tasks such as this one, providing one or more examples is a useful way to ensure that students know what is expected and have a sense of how to turn abstract instructions into something concrete.

The instructions for completing the second phase are as follows:

Assignment 2:
One Page Summary of Presentation, Essay, or Project

The goal of this assignment is to show that you are making progress with your essay, project, or presentation and to show that you are able to coherently explain how it relates to the psychology of creativity.

This assignment should include *everything assignment 1 included* but instead of one sentence about your essay or project it should include a *full page* of *double spaced* text in *full sentences* (not point form). The text should introduce the topic and summarize what approach you will take or what you plan to do in your project, presentation, or essay. It should be grammatically correct and free of spelling errors. You must include at a minimum the one reference you had for your first assignment; it does not hurt to have added a few more references. As with Assignment 1, the reference(s) must be in APA style.

The third phase of the assignment is to write the final essay or create the final project. Note that throughout the process students are encouraged to sense the potential of what they have done to develop into something more. The sense that it holds potential, as well as its capacity to actualize in different ways depending on how one thinks it through, was communicated to the students by giving feedback at each phase of the assignment.

Creative Teaching Methods

We now discuss a few of the methods that are useful for teaching creatively and helping to actualize the creative potential of the students.

Humor

Humor helps to create a fun and interesting learning environment that not only helps in gaining the attention of the students but also fosters creative thinking. Humor helps break down communication and learning barriers between teachers and students (Berk, 1998). Students tend to rehearse and remember class material more if it is presented with humor. Thus humor helps to retain their attention.

Humor may also increase comprehension and retention through the reduction of stress and anxiety (Hill, 1988).

Classroom humor can obviously take the form of jokes, but there are other subtle and effective ways of incorporating humor in classroom. It can take the form of quotations or cartoons in lectures, or humorous definitions. For example, the following was used at the end of an introductory psychology class on psychological disorders:

If you get the joke below you have understood this material. . .

Welcome to the Psychological Clinic! If you have an obsessive-compulsive disorder, please press 1, as many times as you like. If you are co-dependent, please ask someone to press 2 for you. If you have multiple personality disorder, please press 3, 4, 5, and 6. If you are paranoid or delusional, we know who you are and what you want. Just stay on the line so we can trace the call. If you are schizophrenic, listen carefully and a little voice will tell you which number to press. If you are depressed, it doesn't really matter which number you press. Probably no one will answer anyway.

Humorous material used at the beginning of the class encourages students to come on time and creates a positive, receptive atmosphere that is conducive to learning (Berk, 1998).

Interactive Classrooms

A second technique is to incorporate activities that bring the lesson to life. Group discussions and group activities are commonly used methods of increasing class participation. Note however that group activities are not always conducive to creative thinking, and that people are not necessarily aware of this, as they tend to over-rate ideas produced by a group (Baumeister & Bushman, 2010). Groupwork followed by solitary brainstorming and communicating via networked computers can reduce the chance of blocking anyone from speaking, while making it easier to ignore irrelevant input from others when one is "on a roll" on ones own. *It may also be beneficial for students work on a project initially by themselves and put them in groups at a later stage in the project. This provides them a chance to come up with ideas themselves and then hone the idea to actualize its potential and transform it into a final product with the help of group discussions and feedback from others.*

Personalizing the Learning Experience

Another technique is to relate material to the students' experience. Encouraging students to share their personal experiences in regard to the topic being discussed helps them personalize the discussion. Also, we can design assignments in such a way that they give students a chance to relate with them in a personal way. This way

of designing assignments may enhance students' intrinsic motivation to learn. For example, after a lesson on developmental life stages, we gave a bonus assignment to the students along with other regular assignments.We asked them to work on a lifespan scrapbook which described the stages of development with examples. This scrapbook either had to describe their lifespan, or the lifespan of someone they knew.

Metaphor

A fourth technique is the use of metaphor in teaching. Metaphors help students learn and remember new material by connecting it with previously-learnt material (Glynn & Takahashi, 1998). Performance based learning, in which students are encouraged to act out the material, can also facilitate learning and retention. Getting students to act as a neural network, with each individual acting as a neuron and activation spreading by hand squeezing, is an example. Some advocates of performance based learning suggest that teachers be viewed as the stage directors, with the students as the actors (Smith, 1979). The effectiveness of this technique may be due in part to the fact that physical movement can prime memories for past events as well as speculation about future events (Miles, Nind, & Macrae, 2010; Williams & Bargh, 2008). However, physical movement is not vital to the effectiveness of performance based learning. For example, in a class on "talk-therapy" approaches to treating mental disorders, we invited students to find a partner and have one person act as the therapist and the other act as the client, and try out each of the therapies. This appeared to help students remember the material better and become personally engaged in the topic.

Conclusion

Creativity has been largely viewed as a means to an end in education (e.g., a means to improving teaching skills or enhancing student motivation) as opposed to a characteristic we aim to foster in students. Indeed, educational systems sometimes discourage creativity, as it threatens the long established relationship between teacher and student, and the way classrooms function. There are several challenges in bridging the gap between creativity research and educators.

APPENDIX A

PSYO 317 "Psychology of Creativity"

Requirements for all Essays and Projects

Note: It is important that you talk to me in person about your topic well before the submission date if there is anything that is not clear.

Style and Format

- Must be submitted *on the due date: In hardcopy* and also in electronic format by vista dropbox or by vista email (I will let you know).
- Do not call your electronic file "Creativity.doc". Electronic form must be labeled in the following format: Last name _ first name _ PSYO317PPE
- *Title page* with title and your name and name of class.
- All written documents should be double-spaced; do not justify right-hand margins,
- Suggested length: 2,000 words (= about 10 pages including cover page and references page) or the equivalent,
- Must be free of spelling and grammatical errors,
- Should not be worded in an awkward manner; read it over out loud to yourself before submitting to make sure.
- *References* listed at end in APA format; there must be at least a few *scholarly* references (e.g., academic journal articles).

Content

- Regarding your choice of topic: It is best to choose something you are passionate about. But if you choose a topic that most people would consider to be only minimally creative (such as, say, hockey) you may have a challenge ahead of you explaining why you think it is creative. If you genuinely believe that most people just have not yet appreciated the creative element of your chosen topic, and you think you can argue this convincingly, then go for it. But if the reality is that you are just trying to find a way of getting marks for a course while writing about your favorite topic, that will show through
- Must contain *original work* (be aware that there are computer programs that professors can run an essay through to see if it matches anything on the internet).

- Links to YouTube videos are not original work and will not count as part of your submission, but you can include them if they are useful to illustrate a point.
- Must have *references to scholarly material* including not just books but journal articles (references to nonacademic items are not sufficient although you may add some if they are relevant).
- Cite *direct source* of literature; do not cite someone who discussed the study but the person who did the study.
- If you stick to referencing papers we covered in class you will not get a top mark; additional research is required using PsycInfo or Google Scholar.

Essays

- Essays will be assessed for primarily for content, accuracy, clarity, and strength of arguments. Originality, insight, and effort invested are also taken into account.
- Should have introduction that gets reader's attention and states clearly the central idea or focus of the essay.
- Body of essay should develop the idea showing clearly a depth of understanding gained by reading articles related in some way to the psychology of creativity.
- Should have a concluding paragraph.
- Even if your essay is a critical evaluation of a topic discussed in one particular paper, it should be clear that you are using knowledge acquired through reading *other* papers to bear on the evaluation. Similarly, even if you discuss your own creative process, your essay should demonstrate familiarity with the scholarly literature on this creative domain and how it sheds light on your creative process.

Projects

- I am *extremely* open to (even enthusiastic about!) something creative or even outright weird, so long as it is not just creative but also demonstrates an understanding of the *psychology of creativity* (e.g., A scrapbook of your trip to Maui will not get a good mark).
- Integrate the creative output with what you have learned about the creative process through not just the class but also independent scholarly research for this project.
- The application of scholarly theories about creativity to particular creative works takes time. Don't worry if you don't see them right away. The best thing you can do is read lots of articles over the course of the semester, and the connections will slowly start to dawn on you. If you put all your effort into the creative project and leave the scholarly part until the last minute, any connections you try

to make between creativity theory and the creative work will probably feel forced.
- Must have all parts submitted *at the same time*, and *attached together* or *in a container* so that they cannot be separated.
- If it is a movie, edit out stuff that is not interesting (like asking someone on the street what creativity is and having that person say they don't know), and don't film yourself reading class notes.
- Don't make statements such as "this is clearly creative". (Such statements often follow discussion of things that are *not* particularly creative.) Explain why it is creative and what theories it exemplifies or principles it demonstrates in a way that is not gratuitous but genuine.
- *Important*. Projects that consist of fragmentary components can come across as scattered; they *must* at the very least include a synthesis, which explains how they relate to each other, and to the psychology of creativity. A collection of scattered quotes or statements can indicate a fragmented understanding of the topic. Ideally your project should show that you have delved deep into your topic, both in terms of researching it and in terms of synthesizing the research and mulling it over and arrived at a nuanced understanding of the topic. You should show how research on creativity pertains to you or a particular creative individual or creative task.

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Chapter 10
Expect the Unexpected: Teaching for Creativity in the Micromoments

Ronald A. Beghetto

There is no shortage of strategies and suggestions for K12 teachers interested in teaching for and with creativity (see, for instance, Beghetto & Kaufman, 2010; Craft, Jeffrey, & Leibling, 2001; Ritchhart, Moran, Blythe, & Reese, 2002; Swartz & Parks, 1994; Tan, 2007). Where these strategies and suggestions sometimes fall short is in helping teachers recognize and respond to unexpected curricular opportunities for developing students' creative potential. These fleeting curricular opportunities, called micromoments (Beghetto, 2009), emerge anytime the planned lesson takes an unexpected turn (e.g., a teacher asks a known answer question and a student responds in an unexpected way).

Perhaps the best time to help teachers develop their awareness of and confidence in responding to these micromoment opportunities is before they start teaching (i.e., in their teacher preparation programs). Doing so will help ensure that teachers enter their first year of teaching better prepared to support students' creative potential. The purpose of this chapter is to discuss ways creativity researchers and teacher educators might increase prospective teachers' awareness and confidence in teaching for creativity in the micromoments. The chapter opens with a description of why and how it is important to develop *in-the-moment awareness* of opportunities for supporting creativity when teaching. This is followed by a detailed overview of a simulation that I developed and use to help prospective teachers become more confident and competent in responding to unexpected curricular moments. The chapter closes by briefly highlighting future directions for how to help practicing and prospective teachers support student creativity in the micromoments of their classroom.

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Increasing Awareness about Creative Micromoments

Prospective teachers enter teacher education programs with well developed—but often tacit—beliefs about the nature of creativity and the role that creativity might (or might not) play in the classroom. These beliefs are shaped, in part, by prospective teachers' own prior K12 schooling experiences (Beghetto, 2010a). By the time prospective teachers have graduated from high school they have logged nearly 13,000 h in K12 school. These prior schooling experiences serve as an "apprenticeship of observation" (Lortie, 1975)—shaping prospective teachers' images, beliefs, and assumptions about teaching (Borko & Putnam, 1996; Richardson, 2003). It is therefore important to help prospective teachers recognize and expand their conceptions of the creative potential of unscripted moments in the classroom. In my work with prospective teachers, I typically start the course by having them complete a self-assessment to surface their beliefs about teaching and learning, the nature of creativity, and their own prior schooling experiences. I then share perspectives about the nature of creativity from the creativity research literature and introduce prospective teachers to the notion of curricular micromoments, including how these moments can serve as opportunities to support student creativity.

Micromoments in the Classroom

Creative micromoments are brief surprising moments of creative potential that emerge in everyday routines, practices, and planned experiences. In the classroom context, creative micromoments emerge anytime the planned curriculum meets the lived curriculum (Aoki, 2004; Beghetto & Kaufman, 2011). This meeting of the *planned* versus *lived* curriculum provides opportunities for teachers (and students) to explore, learn, and experience something new, unscripted, and unplanned. Of interest for the present chapter are the classroom micromoments that occur whenever a student shares an unexpected idea.

Unexpected student ideas have the potential to disrupt the planned curriculum because teachers (and students) typically follow the I.R.E. (Mehan, 1979) pattern of talk in which teachers *Initiate* interactions (asking known answer questions), students *Respond* (trying to provide a response that matches what the teacher is expecting to hear), and teachers *Evaluate* student responses (determining whether the students response fit the teachers expectation). Of course, teachers do not always use the I.R.E. pattern of classroom talk, and it is not always used in such a scripted fashion. However, as Cazden (2001) notes, the IRE pattern is quite ubiquitous and, for many teachers, serves as the "default" pattern of interaction in classrooms. Moreover, there is evidence that students are introduced to this pattern early in their prior schooling experience (Cazden, 2001).

For instance, the results of a recent study of 70 prospective teachers (Beghetto, 2010b) indicate that the elementary school grades—first grade in particular—was most frequently recalled by prospective teachers as when they first realized that successful participation in class discussions was more like a guessing game (i.e., guess what the teacher wants to hear) rather than an opportunity to share and develop their own ideas. Moreover, prospective teachers explained in open-ended responses that they learned several ideational inhibiting lessons from these convergent patterns of classroom talk, including: It is not always safe to express one's ideas; respond only if you know what the teacher is looking for; never make eye contact with the teacher when you don't know the answer; and if you wait long enough, others will answer the question for you. Anyone who has participated in a class discussion likely will recognize these "rules of the game" and anyone who has taught likely has experienced the behavioral manifestation of these rules (i.e., asking the class a question and only a small fraction of students are willing to raise their hands and participate).

This pattern of interaction is problematic on a variety of levels. Because the IRE pattern of talk is so ubiquitous and introduced to students so early in their schooling experience, prospective teachers may not view it as one of the many ways teachers can interact with students but rather as *the way* teachers and students talk in school. Consequently, prospective teachers are likely to reproduce this pattern of talk in their future classrooms simply because it fits with their prior experiences and conceptions of how teachers and students interact. When teachers develop this unconscious habit of looking for predetermined responses they, as Black and Wiliam (1998) note, not only inhibit student learning but also become less flexible and confident in their ability to "deal with the unexpected" (p. 7). As result, students learn that unexpected ideas are not welcome, no matter how thoughtful, meaningful, or potentially creative. Moreover, prospective teachers fail to learn—via vicarious modeling from their own prior teachers—the flexibility and confidence necessary to recognize the micromoment potential presented by the utterance of an unexpected idea.

Unexpected Ideas: Curricular Uncertainty or Creative Potential?

In the context of the typical IRE pattern of classroom talk, unexpected ideas present a micromoment decision for teachers: *Am I willing to embrace curricular uncertainty and explore this unexpected idea? Or should I redirect the class back to the safety of the known, pre-planned lesson?* Prior research on in-the-moment instructional decision making suggests that teachers likely would choose to redirect the class back to the planned lesson rather than explore where a student's unexpected idea might take them. Results from one of the earliest studies on in-the-moment instructional decision making (Clark & Yinger, 1977), for example, indicate that when the instructional process is interrupted by unexpected events, teachers sometimes consider alternative courses of action but typically choose not to explore

those alternatives. Clark and Yinger summarized this finding by noting that ". . .for various reasons, teachers tend not to change the instructional process in midstream, even when it is going poorly" (p. 301).

One reason why teachers may not explore unexpected alternatives is because teachers, like most people, are typically risk averse. Consequently, teachers may view unexpected ideas as taking them off-track into uncertain curricular territory, perhaps resulting in curricular chaos. Findings from prior research (e.g., Beghetto, 2007; Kennedy, 2005) have suggested that both practicing and prospective teachers generally view unexpected student ideas as potential disruptions and, in an effort to avoid getting taken off-track, choose to gently dismiss or redirect the class back to the planned lesson.

One of the easiest ways to gently dismiss students is quickly redirect an idea. For example, noting that the idea or student is creative (e.g., "That's a creative way to think about it. . .") and in the same breath bring the discussion back on the expected curricular path (e.g., ". . .Now, let's get back on track."). This is not to say that soft dismissals are never warranted or appropriate. Rather, soft dismissals become problematic when they occur with regularity.

Results of a study that examined students' creative self-beliefs (Beghetto, 2006), for example, indicate that although more creatively inclined students reported that their teachers told them they were creative, they were also significantly more likely to report that their teachers didn't really listen to them and had given up on them (Beghetto). It would seem that, in some instances, teachers telling students they are "creative" may actually be a gentle or indirect way of letting students know that their ideas are off-base, not worth listening to, and not aligned with what their teacher expects or wants to hear. This form of soft dismissal represents the behavioral manifestation of the seemingly widespread creative-student-as-trouble-maker stereotype held by teachers (Chan & Chan, 1999; Guencer & Oral, 1993; Plucker, Beghetto, & Dow, 2004; Scott, 1999), despite the fact that teachers generally espouse positive feelings about creativity (Westby & Dawson, 1995).

In order for teachers (be they prospective or practicing) to align their espoused beliefs of valuing creativity with their micromoment actions, teachers need to willingly embrace the risk inherent in exploring an unexpected student idea. This willingness might be fostered through the recognition that although unexpected ideas are signifiers of curricular uncertainty, they are also signifiers of creative potential.

Unexpected Ideas as Signifiers of Creative Potential

Although unexpected student ideas present teachers with curricular uncertainty, they also present teachers with opportunities to recognize and develop students' creative ideation. This is because creative ideas are, by definition, unexpected ideas. Importantly, creative ideas are also relevant, meaningful or task appropriate (see Plucker et al., 2004; Sternberg, Kaufman, & Pretz, 2002). In this way, not all

unexpected ideas are creative ideas. In the real time of classroom discussions it is often difficult for teachers to assess the relevance or meaningfulness of unexpected ideas unless teachers take the time to follow-up and explore those ideas with students. This, of course, presents curricular uncertainty because it is difficult to know where such an exploration will lead. If creativity were simply unbridled novelty then it would make sense that teachers avoid such an exploration because doing so may lead to nothing more than a waste of precious class time. Fortunately, creativity is not simply unconstrained originality.

By recognizing that creativity is the combination of novelty and task appropriateness (as defined within a particular context or activity), teachers can come to realize that when unexpected ideas manifest during class discussions, supporting creativity doesn't mean "anything goes" but rather that teachers should briefly explore whether the unexpected idea fits within the academic framework of the discussion. This is a slight adjustment to what many teachers already do. The difference is rather than base the evaluation of the student's idea on whether the idea fits with what the teacher expected to hear, the teacher can briefly explore the idea and assess whether the novel idea meaningfully fits or contributes to the discussion at hand.

In order for this to happen, teachers and students need to work together to determine how and whether the idea is relevant in the context of the particular class discussion. This requires, on the part of teachers, the flexibility and confidence to briefly explore unexpected ideas (e.g., "Help us understand how what you are saying fits with our current discussion?") and provide informative feedback to help develop students' subject matter and situational knowledge necessary to recognize when their ideas may need to be reworked or abandoned because the idea doesn't fit the particular context (see also Kaufman & Beghetto, 2011). In this way, the micromoments that manifest when students' share unexpected ideas become teaching opportunities that allow teachers to provide targeted feedback that, in turn, can help students' simultaneously deepen their subject matter understanding and develop their creative competence.

Efforts Aimed at Increasing Awareness

In my work with prospective teachers, I endeavor to help them become aware of the potential value—and difficulty—inherent in exploring and providing informative feedback on students' unexpected ideas. I do so by using a combination of focused autobiographical reflections, segments of video footage, transcripts from actual K12 lessons, and introducing them to various classroom discussion techniques that focus on exploring and deepening students' understanding (as opposed to the more convergent IRE pattern of classroom talk).

The focused autobiographical assignments have the goal of helping prospective teachers recognize and identify patterns of classroom talk they have experienced and learned as part of their own prior schooling experience. We watch video

footage of classroom teaching, discuss how teachers in the videos respond, make comparisons with our own prior schooling experiences, and consider whether and how teachers typical responses help (or hinder) the development of students' creative ideation. Video footage and transcripts from actual lessons help illustrate the subtle dismissals of unexpected ideas that occur during a lesson. The transcript below, for instance, is an excerpt from video footage of a sixth grade science lesson (Hannah & Abate, 1995) that I frequently use when introducing examples of micromoment dismissals:

Teacher: I need someone to tell me what a hypothesis is.
Student: A what. . .a what?
Teacher: *[stressing each syllable]* A Hy – Poth – E – sis.
What do you THINK that word is?
We have talked about it a little bit before.
Andrea, what do you think it is?
Andrea: *[softly]* A plant.
Teacher: A plan. That's a good guess. . .
Andrea: *[louder]* Plan-T.
Teacher: A PLANT!?—*[look of surprise]* ok, we'll put that up.
[writing "plant" on the chalkboard].
I'm going to put every answer up we'll try to see. . .what we've got
What else, Tim?

When discussing the above segment with prospective teachers, I invite them to speculate about why the teacher seemed more open to the response when she thought she heard "plan" versus when she realized the student actually said "plant." We also discuss how writing the response on the board and turning to the next student is an example of a micromoment dismissal because the teacher never returns to or explores that students' idea—transforming the chalkboard into an ideational graveyard. Examples, such as this one, are not meant to demonize teachers but rather illustrate the concept of soft dismissals and how common, subtle, and often unintentional these dismissals are in the flow of the everyday classroom.

In addition to highlighting potentially problematic patterns of classroom talk, I also provide prospective teachers with a variety of examples, demonstrations, and strategies used by teachers who encourage and effectively explore unexpected ideas. *Exploratory Talk* (Mercer, 1995) is an example of one such strategy. Several studies (Mercer, Wegerif, & Dawes, 1999; Rojas-Drummond, Perez, Velez, Gomez, & Mendoza, 2003) have demonstrated that the use of Exploratory Talk strategies has resulted in improved academic learning and creative reasoning.

Exploratory Talk is an instructional strategy that has the goal of helping teachers engage their students in the exploration and challenging of ideas while at the same time adhering to a set of social ground rules (Mercer, 1995; Wegerif, 2005). The following two ground rules are particularly relevant with respect to developing students' creative ideational competence (a) students will be asked to make their reasoning explicit and (b) challenges and alternative perspectives will be

encouraged and expected. A key indicator that students have adopted an exploratory orientation is that they "are able to change their minds in response to good arguments" (Wegerif, 2005, p. 226).

A clear illustration of this exploratory orientation—which I often show to prospective teachers in my classes—comes from various segments of Kamii's (2000) video footage of second graders working on double-column addition and subtraction problems. Consider, for instance, the following segment of video footage in which students are working through a double column addition problem:

Teacher:	*[Writes 87 + 24 on chalkboard, waits 20 seconds and then calls on a Student]* Celici?
Celici:	Hundred and one.
Multiple Students:	*[loudly]* Disagree! Disagree!
Teacher:	Brian what did you get?
Brian:	Hundred and ten.
Multiple Students:	*[loudly]* Disagree! Disagree! Disagree!
Teacher:	Jaycee?
Jaycee:	Hundred and eleven.
Multiple students:	*[loudly]* Agree! Agree! Agree!
Teacher:	Okay. Who wants to try to explain how to get the answer? Alright, Jaycee?
Jaycee:	I know that eighty and twenty is one hundred. And then I knew that six and four was ten. So I took the seven and four and that made eleven. . .hundred and eleven.
Multiple Students:	Agree. That's how I did it. . .
Brian:	I disagree with myself.
Teacher:	You disagree with yourself? Which do you think it is now, Brian?
Brian:	Hundred eleven.
Teacher:	Okay. Celici, what about you? Do you still think it's . . .
Celici:	Hundred and eleven.
Teacher:	Okay, let's go on to another.

As illustrated in the above excerpt, when students share their answers, other students variously challenge (e.g., "Disagree!") or validate responses (e.g., "Agree!" and "That's how I did it."). The teacher then asks students to explain their answers. As a result, one of the students, Brian, who initially thought the answer was 110 publically states, "I disagree with myself." The teacher recognizes this and asks, "You disagree with yourself?" The student confirms by stating the correct answer, "Hundred eleven." The teacher then checks with another student (Celici) who initially thought the answer was 101 and the student quickly confirms that she now understands the answer to be 111.

The above excerpt (along with several others presented in the Kamii, 2000 video) exemplifies several key aspects of Exploratory Talk (e.g., sharing one's

ideas, making one's reasoning explicit, challenging and affirming ideas of others, and being willing to change one's perspective when presented with compelling arguments). Moreover, it provides a basis for prospective teachers to visualize what it looks like when a classroom teacher has cultivated an environment whereby youngsters enact ground rules that encourage vigorous engagement with one's own and one another's ideas. Doing so also serves to challenge common assumptions held by prospective teachers (e.g., "Elementary age children are too young or too fragile to engage in this type of ideational exchange").

In addition to more formal strategies like Exploratory Talk, I also introduce and demonstrate various "in-the-moment" teacher-response prompts and stems. These prompts and stems can be used by teachers when, for instance, they are attempting to draw-out (e.g., "Tell us a bit more about. . ."), clarify (e.g., "Help me understand what you mean. . ."), refocus (e.g., "How does what you are saying fit with the topic. . ."), and revisit student ideas (e.g., "Let's return to what Olivia said. . .").

I use these demonstrations and examples with the goal of helping prospective teachers imagine how they might effectively explore and work with unexpected ideas in their own teaching. Developing awareness about the phenomena is an important first step; however, the difficulty presents itself in attempting to enact this belief when teaching. I therefore also provide opportunities for prospective teachers to apply this awareness-in-practice so that they can start developing the confidence and knowledge of how to teach for creativity in the micromoments.

Increasing In-the-Moment Awareness and Confidence

It is one thing to have awareness of a phenomena and it's quite another to be able to act on that awareness. Indeed, social scientists (e.g., Argyris & Schon, 1974) have long recognized the chasm between espoused beliefs (i.e., how we hope to act in a particular situation) and enacted or "theory-in-use" beliefs (i.e., what we actually do in that situation). Teachers who effectively teach for creativity have the experience and knowledge necessary to balance improvisation with structure (Sawyer, 2011). They are also more likely to recognize emergent curricular opportunities and respond with more improvisational flexibility in those moments than teachers who have less experience (Borko & Livingston, 1989; Housner & Griffey, 1985). Moreover, they anticipate that unexpected moments will emerge in their lessons and have presence of mind to confidently respond to those opportunities when they do emerge—making necessary adjustments to their lesson-as-planned to explore unexpected student ideas without letting the lesson-as-lived drift into curricular chaos (Beghetto & Kaufman, 2011).

This level of in-the-moment awareness and confidence is a type of expertise that develops, like other forms of expertise (see Ericsson, Krampe, & Tesch-Romer, 1993), with deliberate practice. In order for prospective teachers to develop their in-the-moment competence they therefore need opportunities to enact their own understanding, receive informative feedback, observe competent models, and refine

and re-enact their developing understanding. Doing so will help prospective teachers better understand how they actually respond to such situations and receive the competence-related feedback necessary to help them develop their confidence and knowledge (Bandura, 1997). This, in turn, will put them in a better position to start closing the gap between their espoused values to support creativity and their actual micromoment teaching practices.

Expecting the Unexpected: A Micromoment Teaching Simulation

Over the past decade, I have developed several teaching simulations that I use in my work with prospective teachers. My approached is informed by a "theory of action" (Argyris & Schon, 1974) framework that attempts to zero in on the type of learning experiences necessary to narrow the gap between one's espoused teaching beliefs (e.g., "I want to teach for creativity") and one's actual micromoment teaching practices (e.g., when students share unexpected ideas, those ideas are ignored and redirected rather than explored).

As Argyris and Schon (1974) have explained, most professionals operate under a theory of action called "Model I." Under this model, one's behavior is motivated by a desire to protect oneself from feeling uncomfortable, out-of-control, or vulnerable. The action strategies of this model serve to buffer individuals from experiencing discomfort, typically by avoiding direct feedback on one's practice and when faced with uncertainty moving to quickly restore order.

Model I behaviors are quite understandable as no one wants to be put in a position of feeling vulnerable, out of control, or at a loss for what to do. However, this drive to "master the situation" (Schön 1983) can buffer professionals from identifying areas in need of improvement and thereby comes at the cost of developing one's competence and long-term effectiveness. With respect to teaching, Model I behavior is exemplified in the tendency to desperately cling to a lesson plan when Rome burns around you (as opposed to having the confidence to step away from a lesson plan to explore the creative potential that inheres in unexpected curricular turns).

The alternative to Model I behaviors, what Argyris and Schon (1974) call Model II, describes a behavioral world in which individuals publicly test their ideas and behaviors in an effort to become more aware of and improve their professional practice. In this model, individuals work collaboratively in an effort to reduce defensiveness and increase opportunities for learning. The goal is not so much about finding *the* solution to a particular problem as it is developing more effective approaches to problems. Doing so takes time, trust, deliberate practice, and collaboration.

I have found that facilitating this type of learning can be quite challenging because when confronted with curricular uncertainty—in the real-time of teaching—prospective teachers (and most all teachers) experience a deep "need to know" in such moments and are thereby vulnerable to seeking out prescriptions and

directives (i.e., "What is *the* right way to handle this?"). As a facilitator the challenge is to avoid succumbing to the temptation of providing prescriptions or conversely offering only vague generalities that are of little to no help in assisting prospective teachers in exploring the creative potential that inheres in curricular micromoments. Rather, it is important for the facilitator to ensure that prospective teachers have opportunities to receive specific feedback on their instructional actions and the consequence of their actions, consider alternative strategies, and, importantly, have a chance to test out those alternatives. Doing so can establish a learning environment that allows prospective teachers to not only critically examine the alignment between their espoused values and their actual practices but also try out ways to close the gap between the two.

In what follows, I describe a micromoment teaching simulation that has the goal of helping prospective teachers recognize and respond to unexpected moments that emerge in the course of teaching an academic lesson. It is a simulation that I typically use early in the course, after having introduced prospective teachers to the phenomena of micromoment dismissals and demonstrated alternatives for exploring students' ideas. The goal of this simulation is to have prospective teachers practice exploratory discussion techniques and become more aware of how they respond in-the-moment to unexpected student ideas. The simulation has four phases: Plan, enact, reflect, and reenact.

Planning Phase

In the planning phase, prospective teachers prepare a mini lesson that could be used as part of an actual academic lesson. More specifically, they are asked to plan the first ten minutes of a lesson that has two goals: introduce a topic (in their academic subject area) and assess students' prior knowledge of that topic through the use of class discussion. They also are required to create a learning objective for their lesson based on their state's Academic Content Standards and then develop one or two learning outcomes (using guidelines for writing instructional objectives described in Gronlund, 2003). They are provided with a lesson-planning guide that helps them in planning their lesson. The planning guide requires that each prospective teacher specify the components of their lesson (i.e., subject area, grade level, state learning standards, learning objective, learning outcomes, requisite prior knowledge that students need to successfully engage in the lesson, and any materials needed to carry out the lesson).

Given that the purpose of the simulation is to help prospective teachers become aware of and practice responding to micromoments, I ask them to try to anticipate unexpected student responses and prepare to practice one or two techniques that we have discussed for how to explore and respond in-the-moment to unexpected student ideas. Although prospective teachers know that they will be teaching the lesson to four of their peers who are assuming randomly assigned student roles, they do not have advanced knowledge of the specific nature of the student roles.

Enactment Phase

Once prospective teachers have planned their lesson, they then move to enactment phase of the simulation. On the day of their micromoment teaching simulation, students are arranged into groups of six and lessons are taught in five consecutive rounds. Prospective teachers assume one of three roles during each round (teacher, student, and observer), resulting groups are comprised of one teacher, four students, and one observer for each round. Prospective teachers who assume the role of observer use a semi-structured observation protocol (modified from Acheson & Gall, 2003) to document, minute-by-minute, teacher–student behaviors, including, whether and how teachers respond to student responses to teacher initiated questions. They will then share their observations with the teacher, following the completion of the 10-min lesson. The observer can, alternatively, use a video camera to record the lesson.

Prior to the start of each round, prospective teachers assuming the role of student are assigned a description of their role by random draw. There are more roles than students and roles are redrawn during each subsequent round. This helps ensure a random assortment of student roles for each teaching round. Prospective teachers are also instructed to not reveal their role to the teacher or their peers prior to the lesson, but act out their role once the lesson commences.

The student roles are written to present a range of student behaviors that have the aim of surfacing unexpected moments that the person teaching must attempt to navigate, including students who share unexpected and irrelevant ideas; students who share unexpected but relevant ideas; and students who are confused and try to guess what the teacher expects to hear. The combination of having a variety of student roles and random assignment of the roles helps simulate the phenomena of not knowing whether an unexpected student idea is motivated by confusion, creative ideation, intentional disruption, or some other motive. The only way to find out is to take the time in-the-moment to explore the unexpected ideas.

Guided Reflection Phase

Immediately following the simulation, the prospective teacher who taught the lesson completes a guided reflection in which they identify a micromoment interaction that surprised them and that they would have liked to respond to in a different way. They are then instructed to write out, as best they can from memory, five to ten lines of dialogue that represent how the surprising moment unfolded (i.e., what they said, what the student said, and how they responded). Under each line of dialogue they are asked to jot a parenthetical note to retrospectively describe what they—as teachers—were thinking in that moment (e.g., "I was surprised by this comment"). Once they have completed the lines of dialogue and the accompanying retrospective thoughts for each line of dialogue, they then check their representation of the

dialogue with the observer's notes (or video footage) and with the recollections of their peers who assumed the various student roles.

The observer and peers who assumed student roles provide additional feedback on whether and how well the teacher responded to unexpected student responses, specifically noting: How well they used classroom discussion techniques taught in the class; whether the teacher spent time exploring students' ideas; how effectively the teacher monitored student understanding; and how effectively the teacher supported student learning. The purpose of this additional feedback is to help the prospective teachers who taught the lesson recognize what they did well, what they may have missed, and what they might do differently to improve their in-the-moment responses.

Each prospective teacher is then instructed to write up a micromoment transcript analysis. The guidelines for this write up include (a) Briefly describing the context in which the surprising interaction occurred; (b) The lines of dialogue that illustrate the micromoments; (c) Their parenthetical thoughts under each line of dialogue; and (d) What they would do differently if given the opportunity to reenact that particular moment in their lesson. Prospective teachers are then instructed to bring copies of their written micromoment transcripts to the next class meeting and be prepared to reenact the moment. A hypothetical micromoment transcript analysis is illustrated in Fig. 10.1. This hypothetical write-up is based on the excerpt from video-footage of a sixth grade science lesson that I use when introducing examples of micromoment dismissals (described earlier).

Reenactment Phase

In the final phase of the simulation, prospective teachers have the opportunity to reenact their micromoments as part of a whole-group micromoment workshop. On the day of the reenactment, prospective teachers are randomly selected (and, sometimes, volunteer) to reenact their micromoment with the assistance of four peers and the guidance of their written micromoment transcripts.

The reenactment occurs in a "fishbowl" (Schmuck & Runkel, 1985) and prospective teachers use their written transcripts as a script for recreating the micromoment interaction. In this fishbowl arrangement, the small group reenacting the micromoment serve as the focal point and are encircled by the remainder of the class (including myself and any teaching assistants). The members of the outer circle observe the reenactment of the micromoment and provide feedback and suggest alternative ways that the teacher might have responded. The only ground rule for suggesting an alternative is that the person who makes the suggestion is expected to "jump in" and demonstrate the alternative response. In this way, observers can jump in and out of the fishbowl to demonstrate and test-out alternative responses. The demonstration of alternatives and discussion of the viability of these alternatives continues until no additional suggestions or elaborations are offered. Typically there is need for only two or three micromoments to be explored,

Background: This segment of dialogue occurs at the start of a lesson on developing and testing hypotheses. This segment follows immediately after students have been instructed to get out a piece of paper, put their name on it, and put it aside for later. [Note: Although the parenthetical thoughts, analysis, and moving forward are hypothetical, the dialogue is based on an excerpt of footage from an actual lesson depicted in Hannah & Abate, 1995].

Teacher: **I need someone to tell me what a hypothesis is.**
[I just wanted to quickly review the definition of hypothesis]
Student: **A what…a what?**
[I thought this student simply didn't hear what I said, so I carefully repeat it]
Teacher: **(Stressing each syllable) A Hy –Poth –E -sis.**
What do you THINK that word is?
[I still see uncertainty in my students, so I try to encourage them to think about it]
We have talked about it a little bit before.
[I'm surprised that there are not more volunteers, we have talked about this...]
Andria, what do you think it is?
[Oh, good, Andria has volunteered, she probably knows this..]
Andria: **(softly) A plant.**
Teacher: **A plan. That's a good guess…**
["plan" --this is not exactly what I was looking for, but I can work with this…]
Andria: **(louder) A Plan-T.**
[Wow, that's not what I thought (hoped?) she said]
Teacher: **A PLANT!? – (look of surprise) Ok, we'll put that up.**
[Maybe if I write what they are saying on the board it will spark the answer I want tohear]
I'm going to put every answer up we'll try to see…
What we've got (writing "plant" on board). What else, Tim?
[Tim looks like he might know it (I hope)…]
Tim: **A hard word to say.**
[Wow, this is really going off track here and we have a lot to cover today]
Teacher: **Ok, it's a hard word.**
[I am starting to get frustrated a bit here - worried we will run out of time]
Students: (indistinguishable mumbling).
Teacher: **Felton, what do you think it is?**
[Ok, Felton, I hope you know this …]
Felton: **Kind of animal?**
[Oh, no. We're really getting off track now!]
Teacher: **Ok, maybe a kind of Animal (writing word on board)**
…we're kinda getting off track…

Fig. 10.1 Example micromoment transcript analysis

because by the time two to three fishbowl explorations have concluded the vast majority of the micromoments issues experienced by prospective teachers have been explored and addressed.

Extensions and Future Directions

The above simulation represents one of many possible ways for how creativity researchers might use simulations in their work with practicing and prospective teachers. My students have noted, in course evaluations and assigned reflections, that these simulations are one of the most valuable learning experiences of the course—helping them recognize subtle complexities in attempting to teach for creativity, identify specific areas that they might continue to improve upon, and

develop their confidence in their ability to navigate the curricular uncertainty inherent in exploring unexpected student ideas.

Although I am confident that this type of simulation holds promise for developing students' competence in teaching for creativity in the micromoments, more systematic study of the efficacy and outcomes of using such simulations is needed. Specifically, additional work is needed to explore how such simulations might be applied to work with in-service teachers and teachers who do not feel comfortable role-playing.

Although I have never had a class baulk at the idea of role-playing, it is conceivable that some prospective and in-service teachers, in some situations (e.g., when there hasn't been enough time to establish a trusting class environment), may not want to role-play. Future research efforts might focus on the vicarious learning that occurs for those who may choose to watch rather than directly participate in simulations and role-plays.

Another potential fruitful area of applied research would be exploring how such simulations and role-plays might be used with students across the educational life span (be they K12 or college level students). Doing so might go a long way in helping to engender a classroom climate more conducive to creative expression. Indeed, such efforts might prove to be particularly important given that students' willingness to share and refine tentative ideas requires more than an encouraging teacher—it also seems to require an environment in which ideational risk-taking is encouraged and supported by one's peers.[1]

Concluding Thoughts

The purpose of this chapter was to describe how prospective teachers might be supported in developing their awareness of and confidence in teaching for creativity in the micromoments. I highlighted the importance of helping prospective teachers recognize micromoment opportunities for nurturing student creativity, inherited patterns of teacher talk that can foreclose those opportunities, and the importance of providing examples and demonstrations of alternatives ways to respond to unexpected ideas. I then described the need for helping prospective teachers develop their in-the-moment awareness of these opportunities and shared a micromoment teaching simulation that I developed and use in my work with prospective teachers.

It is my hope that this chapter has sparked interest in the viability of teaching for creativity in the micromoments and, in turn, will motivate creativity researchers to join me in systematically exploring whether and how the use of simulations (and

[1] I would like to thank the reviewer(s) of this chapter for suggesting that I note the importance of exploring how simulations and role-plays might be incorporated into one's classroom to help create an environment whereby unexpected student ideas are met with peer support rather than peer frustration, exasperation, and unfriendly rolling of the eyes (a phenomena that can, and often does, occur in middle, secondary, and postsecondary classrooms).

related interventions) might carry over into more creativity-supportive classroom teaching. I enthusiastically encourage anyone interested in exploring this line of work to engage in the study of how the approaches described in this chapter, or ideas spawned from those approaches, might put K12 teachers in a better position to teach for creativity in the micromoments of their classroom.

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Chapter 11
Personal Stories, Critical Moments, and Playback Theater

Reva Friedman

Creativity is a universal phenomenon among humans. Simple ingenuity is necessary for survival, and more complex original thinking is credited with leading to societal paradigm shifts (Gorny, 2007; Pink, 2009; Robinson, 2011). Considerable attention has been devoted to uncovering the cognitive and affective attributes of novel thinkers (Bloom, 1985; Csikszentmihalyi, 1997; Goertzel, Goertzel, Goertzel, & Hansen, 2004). Creative activity is often highlighted as the epitome of successful functioning—the "supranormal" self (Maslow, 1968; Rothenberg & Hausman, 1976). It has been well documented in classic works such as *The Courage to Create* (May, 1975) and *Why Man Creates* (Bass & Simon, 1968) as well as in the current research literature (Sayler, 2009; Sternberg & Spear-Swerling, 1998) that personal qualities such as resilience, risk taking, intellectual restlessness, and persistence play a large part in conceptualizing and actualizing novel ideas. Creative, innovative adults have often mentioned these personal qualities as enabling their perseverance in the face of failure or rejection (Neumeister, 2002). These individuals frequently report a pattern of being marginalized during their preadult years at school as well as in the larger society (Hebert, 2011; Kerr, 1994; Kerr & Cohn, 2001; Kunkel, Chapa, Patterson, & Walling, 1995; Shurkin, 1992; Subotnik & Arnold, 1994; Tomlinson-Keasey, 2002). They recall repeatedly facing the dilemma of choosing between pursuing activities that support the development of creative potential or activities that represent "normal" societal expectations (Csikszentmahalyi, 1996; Subotnik & Arnold; Tomlinson-Keasey).

Perennially, memoirs and biographies focusing on successful creative adults affirm the importance society places on learning from these exemplary individuals. Their narratives tend to focus on telling the story of their choices that lead to noteworthy accomplishments (e.g., "Biography: Biographies, famous people" . . . (n.d.); Denenberg & Roscoe, 2006; Goertzel et al., 2004). A review of these

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interviews and memoirs also reveals that these individuals are often described as displaying creativity-related cognitive and affective characteristics that might be labeled as less socially acceptable [e.g., *Steve Jobs* (Isaacson, 2011); *Up close: Bill Gates* (Aronson, 2009)]. Friedman et al. (2010) found that teachers preferred learner characteristics such as curious, orderly, and conforming rather than rebellious, messy, and critical. In fact, Holland and Astin (1962) suggest that creative performance is in part a function of under-socialization (i.e., less committed to commonly accepted ways of thinking and acting), a quality in part referred to as "out of the box" thinking.

Interestingly, creative, successful adults often refer, for example, to the initially negative consequences of nonconformity as contributing to the resilience and perseverance they name as essential to success (Friedman-Nimz & Skyba, 2009). Published recollections of their childhood and adolescence are frequently employed in programs for intellectually gifted, creative students (Hebert, 2011; Hebert & Kent, 2000). Using biographies, autobiographies, and films are considered effective media for helping bright and creative youngsters understand themselves and cope with being different from their chronological peers (Hebert). The primary purpose for using these accounts is to encourage youngsters to identify with noteworthy, successful, creative persons and subsequently to emulate the values and actions that are publicized as contributing to realizing creative potential. Even a cursory scan of pertinent extant literature reveals the consistent message that print and film media can be used to nurture creative youngsters' intrapersonal development, positive self-talk, self-regulating behavior, and the ability to persevere despite setbacks (e.g., Adderholt-Elliot & Eller, 1989; Milne & Reis, 2000; Newton, 1995).

The instructional and counseling methods recommended for using media therapy have not changed over time. Small group discussions and reflective journaling are the most commonly recommended teaching strategies. Current writings about effective teaching point out that effective, lasting, and generalizable learning need to be inherently attractive to learners, including qualities such as personal meaning, verbal and physical activity, rigorous thinking, and a performance orientation. These qualities are commonly grouped under the conceptual umbrella of "learner engagement," and are considered to be key components of twenty-first century learning (Jones, 2009).

In this chapter, I describe a three-part process for adapting narratives to promote learner engagement that accomplishes the purposes mentioned above. This requires teachers to use biblio, cinema, and theater therapy in novel ways—to teach creatively as well as nurturing our students' engaged learning and creativity. Rather than conceptualizing the three parts as a linear sequence, I think of the process as a learning spiral. A spiral starts with a small central core and spins seamlessly linked but open circles. Each subsequent circle enlarges the spiral and builds on the previous iteration. Last, the spiral is an open figure, signaling that the learning process continues infinitely. The image is also congruent with creative thinking: diffuse, flowing from prior knowledge and experience, and continually incorporating fresh perspectives, never ending.

I begin at the spiral's core: exploring implicit values that impact one's ability to nurture creativity. The second coil incorporates previous insights when we expand

our perspectives from micro (my story) to macro (their story) as learners identify and unpack critical moment narratives in the early lives of well-known creative adults. In the third coil of the learning spiral, I combine retellings of these incidents with theater techniques designed to spark new perspectives, thoughts, feelings, and among young people, both individually and as a community of creative explorers. Wherever it is pertinent, I share key teaching moments.

Core of the Learning Spiral: Mapping Implicit Values

For nearly my entire professional career as a teacher educator in gifted/talented/creative child education, I have been concerned about a seemingly universal and intractable problem: persistent under recognition of children's creative potential as a member of a specific ethnic, racial, and language group (Erwin & Worrell, 2012). A plethora of descriptive studies attest to the enduring nature of this problem. As a teacher educator, I have attempted to change stereotypical perceptions and to persuade practitioners to change policies as well as practices to no avail. However, several personal "teachable moments" spurred me into reframing the issue and substantially changing my teaching practices.

At the 1997 annual meeting of the National Association for Gifted Children, a panel jointly sponsored by The Association for the Gifted and NAGC was charged with promoting a public discussion focusing on rethinking ways to identify and teach youngsters whose cultural diversity reduced the likelihood that their creative potential would be noticed and nurtured. A middle aged man, apparently of European descent, stood up and announced loudly, "I teach in the inner city of Indianapolis. I deal with diversity every day. I'm looking around this room and I see no diversity here. How can you claim to be qualified to deal with diversity issues?" I was shocked. I looked around the room and saw tremendous diversity in the audience faces whose lineage probably reflected every European country, Asia, the Pacific Rim, Northern Africa, and the full expanse of the Americas. There were men and women in the room, which meant there was likely a diversity of gender identities. There were individuals with disability challenges. I bristled as I realized that he was narrowly interpreting "diversity" as skin tone.

As I watched the heads of audience members nod in assent, my frustration transformed into a moment of insight. If I wanted teachers to transform their practice, they first needed to acknowledge biases and assumptions that prevented them from perceiving potential among diverse students. A key prerequisite to a deep, personal understanding of the experience of diversity needed to begin with uncovering the key defining qualities and values inherited from their forebears. If I wanted teachers to become more sensitive to the ways in which bright and creative youngsters were treated as a fringe population and subsequently marginalized by an education system geared to the middle levels of potential and achievement, they needed an opportunity to reexperience the ways in which THEY had been marginalized in their lives as students. If I wanted teachers to mentor novel thinkers, they needed to recall and reflect on the ways in which they had experienced powerful mentoring that nurtured their talents.

I reexamined the teaching methods I usually employed and reconsidered my options. I had never been a proponent of using readings, lectures, and discussions as my core instructional strategies. Empirical research describing interventions associated with some change in teachers' expressed attitudes about creative learners tend to rely on background readings followed by group discussions and occasionally examining case studies (Siegle & Powell, 2004; Siegle & Reis, 1998). My challenge was to . . .“figure out how to break through the inertia of habit to get people to pay attention . . .” (Ganz, 2009) I needed to use a new approach to begin the process of changing deep-seated (implicit) values and associations. I adapted a creative thinking strategy that had the potential to “make the familiar strange” (Gordon, 1961). This well-documented creative thinking method, synectics, relies on analogy, fantasy, and imagination to change habitual thinking patterns. New perspectives are applied to a process of re-conceptualizing issues, and enhancing novel solutions to problems. In particular, I was interested in its potential to evoke in my students new meanings and a fresh eye.

The first step was for my students (teachers) to explore their ethnicity. McGoldrick and Giordano (2005) use the term “peoplehood” to . . .“refer to a group's commonality of ancestry and history, through which people have evolved shared values and customs over the centuries” (p.2). In direct contradiction to the implicit curriculum of many multicultural education courses, the authors emphasize that ethnicity pertains to everyone, which implies that cultural understanding requires examining everyone's ethnic assumptions. To start the process, each teacher named one or two key ethnic groups with whom s/he and his/her families of origin identified. They read pertinent chapters in *Ethnicity and Family Therapy* (McGoldrick & Giordano, 2005) I preferred this book because it focuses on the reader rather than the reader as an impartial conduit of instruction to youngsters. The content of each chapter includes a rationale for identifying that group as an ethnicity, followed by a working definition and a brief history of the group. There is empirical support that informs the presentation of core values and their effects on family dynamics, strengths, and issues. Chapter authors conclude with a discussion of how these values, perspectives, dynamics and the like are manifested in therapeutic contexts, and how the mental health professional may form a working alliance with the family. After digesting pertinent chapters, each of my students completed a concept map I titled “who are my people?” and presented in Fig. 11.1 below. They named ancestors' ethnic groups, described key qualities, related issues, and negative stereotypes, culminating with naming culturally inherited talents.

In step 2, my students used this background information for structured reflections, stated as open-ended questions such as: “What is your inheritance of values? What are their origins? Which of your potentials were recognized and nurtured? By whom? (teachers and/or other significant adults) Apply the patterns of values in your family to describing how they influence your beliefs about the roles of children, the purposes of education and the nature of creative talent. “The last prompt is designed to connect inward reflections to outward imaginings: “Think aloud about your strengths and challenges as a teacher of bright and creative students.”

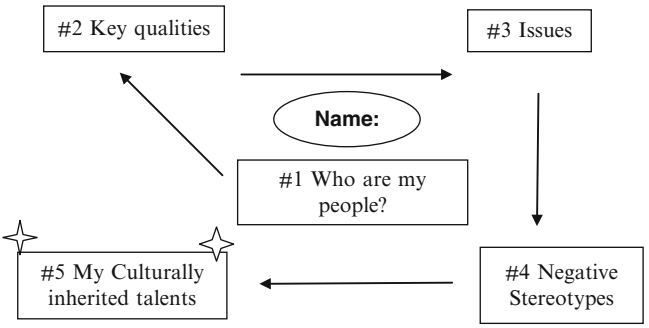

Fig. 11.1 Who are my people activity

Mapping, understanding, and transforming perspectives of implicit values formed the foundation for the next curve of the spiral: applying personal insights to identifying and analyzing critical incidents in the early lives of creative, eminent individuals. A few notable items: some students did not know their ancestry, and thus embarked on a voyage of discovery. Most class members appeared to acknowledge the values, strengths, and unresolved issues they brought to the teaching/learning processes. Some students described experiencing profound insights relative to their implicit attitudes about teaching "out of the box," and about nurturing creative abilities in their students. A few examples are included to illustrate the thoughtfulness with which my students addressed this opportunity (identities are altered).

Example 1: Colonial English . . ."My roots uphold hard work, individual freedoms with a controlled society, achievement, optimism, and education. . . .As long as I played by the 'rules of the game' everything went smoothly." Describing a self-labeled values clash with a teacher. . ."Although I conformed on the outside, I resented it on the inside. . . I need to be sensitive to possible clashes, ask questions rather than impose answers, and make sure that my students see me as someone who gets where they come from."

Example 2: German . . ."I was expected to go to college because education is a means to betterment. . .there was no discussion about an adult reality, and when we went off to college, that was our learning ground. It's hard for me personally to express emotions, and was for sure hard for my father, and still is. . . .I can be reactive to students who are not self-motivated and/or who are emotional when facing failure and wanting to give up rather than persevering". . .

Example 3: Irish/European Jewish "No wonder I sometimes feel so conflicted—the Irish part of my family is solitary, cloaks emotional issues behind stories, while the Jewish part of my family does NOTHING alone. They are so community oriented! And they LOVE to talk about problems." "I think I am better equipped than some of my peers to understand kiddos from a variety of backgrounds. For sure, I value group work just as much as individual work. It is hard for me to accept

parents who don't think their kiddos are terrific. On the other hand, I resent parents who think they can tell me how to treat their precious child. All are good to notice and not let my emotional reactions drive me."

Learning Spiral, Coil Two: Creative Exploring through Critical Incidents

In the next iteration of the learning spiral, my students applied their personal insights to a more public context through investigating the lives of creative, eminent individuals, focusing on the development of personal qualities that shaped and supported their emerging creativity. Why explore the lives of these individuals? They are often singled out as the epitome of actualized potential. It is common for us to imagine the guidance they might offer when we are faced with a dilemma or difficult decision (e.g., "What would Jesus do?"). We encourage young people to identify and emulate the lives of these important individuals.

In particular, one theme common to the lives of eminent creative persons is overcoming adversity. These are individuals whose ingenuity seems to develop as a function of resolving seemingly insurmountable challenges. As adults, they demonstrate key qualities of creative thinkers. They are the personification of the popular children's story *The Little Engine that Could* (Piper & Lenski, 1930). However, we tend to forget that the adult is not the child, and that these qualities emerge over the life span, often tempered in the forge of critical incidents. Therefore, we focused on the childhood/youth of creative adults. This would also promote generalizing my students' learning to their work as teachers. In addition, if they planned to incorporate studying the lives of eminent creative people, childhood incidents would be more pertinent to their students. My students embarked on a three-step process of identifying pertinent critical incidents, analyzing them from the perspectives of personal qualities, significant others, and the cultural context, and applying their insights to working with highly creative youngsters.

The first step consisted of determining the individual to study, which often depended on the availability of information about that person's childhood and youth. It was important to ascertain that the individual was known for acts that benefited society. It was also important to distinguish between an important event (e.g., Helen Keller contracted scarlet fever as a toddler) and a critical incident/turning point moment (e.g., Sandra Day O'Connor deciding whether to live on the family ranch, which eliminated all opportunities for a full secondary school experience). I used the analogy of a "T" in the Road of Life; that is, the individual has exhausted all options and needs to do something different that is likely to shape that person's future.

In the next step, my students investigated the incident thoroughly so that any inferences would be based on data rather than legend. The following questions guided their investigations and analyses:

1. Describe the event. What was that "'T' in the Road of Life?" Include the actions the person took.
2. Describe the immediate effects on your person and significant others.
3. How did the reactions of the individual's significant others affect your person?
4. In your estimation, what INTELLECTUAL, CREATIVE, AND SOCIAL-EMOTIONAL characteristics helped your person make this difficult decision?

For the final step, my students speculated about how they might have resolved the issue and how their family might have reacted. They compared their milieu to that of their creative person. For example, the Native American princess Sarah Winnemuca had to choose whether to remain on a reservation with her tribe, assume a leadership role, and advocate for tribe members—or—to marry an Anglo settler and move away from her tribe to live a less public and dangerous, more conventional life. She chose to work for her tribe and is attributed with making important changes in federal policies, and holding government agents accountable to enacting agreements and meeting federal commitments. Mary Cassatt challenged Philadelphia Main Line society's implicit rules when she realized that if she remained in her comfortable surroundings, she would be barred from the career she desired as a painter. In her desire to become a conductor on San Francisco's segregated trolleys, Maya Angelou defied her mother's desire to shield her from discriminatory work practices. Susan B. Anthony tackled her teacher's sexism when he excluded her from learning mathematics. Charles Darwin's passionate quest to become a naturalist was hindered by paternal expectations and limited career options as well as his desire to enact those expectations.

When we compared these and other incidents, it became apparent that the stories were timeless and universally applicable to issues related to choosing a creative life. There was an integration of the cognitive and affective domains for the eminent individual as well as for the student who analyzed the incident. For the final aspect of the analysis my students speculated about ways to use these stories with creative youngsters, focusing on promoting self-direction and self-understanding.

Learning Spiral, Coil 3: Developing Fresh Perspectives

"Learning skills and practices is not like learning a formula; it's more like learning how to ride a bicycle. You can read 10 books about it or listen to someone lecture about it all day, but how do you really start learning to ride a bicycle? You get on. And you fall. That's how you learn practices" (Ganz, 2009).

My perpetual challenge as a teacher is to find teaching strategies that make the process of learning new knowledge and skills "sticky" (i.e., relatively permanent) so that they are absorbed into my students' teaching practices. I look for strategies

that demand active learning and are relevant to my students' lives. I especially seek strategies that help my students experience teaching with a fresh eye. Personal narratives have that power. They are used increasingly in contexts from medicine to community organizing. Years ago, I had the good fortune to experience Playback Theater, which I have adapted to this context.

Playback Theater represents a blend of psychodrama and improvisational theater with the timeless and universal oral traditional of story telling (Fox & Solas, 1975). Its stated purpose is to promote dialogue between different public voices as well as a personal redefinition of one's identity. "We find out who we are by telling our stories. And as others bear witness and tell theirs in response, a deep and empathy-building conversation is created through our collective stories brought to the stage. . .playback theatre provides an opportunity for creativity and connection. . ." (Fox & Solas). Since its initial launching in New York's Mid-Hudson Valley, the method has expanded to an international network, used in educational, therapeutic, social change, and arts settings. Participants range from young people through senior citizens.

The Playback Theatre's Web site describes the process as follows: "A group of people in a room, a hall, a theatre. They face a row of actors sitting on boxes. On one side sits a musician with an array of instruments. On the other, an emcee, who waits next to an empty chair. This is for the "teller," who will come from the audience to tell a personal story. Then, in a ritualized process, using mime, music and spoken scenes, the players will act out the story. After one teller, another will come. In this way, the individuals in the audience will witness a theatre of their own stories" (http//:playbacktheatre.org). The emcee, titled "The Conductor," acts as a facilitator between the teller and the actors. As the actors breathe life into the story, the teller coaches, corrects, or amplifies the story. The story may be retold several times as the improvisation transitions into a play. Along with a collaborative "talk back" (i.e., discussion) plan, the play can be recycled with fresh audiences for a variety of purposes. For example, a local group of at-risk teen girls (in my town) created such a play addressing one young woman's experience of anorexia. The group reenacted the play with several middle school groups and their guidance counselor, and then led a discussion about the pressures that lead to eating disorders.

In *Why Stories Matter*, Marshall Ganz, nationally recognized community organizer and developer of campaign field workers' training for the 2008 Obama presidential campaign, makes the following point about using stories to activate change: "In a story, a challenge presents itself to the protagonist who then has a choice, and an outcome occurs. The outcome teaches a moral, but because the protagonist is a humanlike character, we are able to identify empathetically, and therefore we are able to feel, not just understand, what is going on." (2008)

I adapted Playback Theater as a creative teaching method to address the goal Ganz identifies through creating an imperative for a child/youth to identify with another young person (who attained eminence for creative accomplishments) and empathically experiencing that individual's challenges related to creative talent development. My desire were for youngsters with high creative potential to

perceive themselves as capable of mobilizing talents and personal qualities when faced with challenges and obstacles, and to demonstrate to their teachers a novel method for attaining this goal.

The adapted process started with developing "improvisation starters" from the turning point moments such as the ones described earlier. Identities of the creative adults were disguised, and the incidents were written as incomplete, ill-structured problems to provide opportunities for imaginative thinking and creative problem solving. Several samples are included, expanded from the individuals and their issues as described earlier. Note that in the version used for Playback Theater, I revised the stories to make them relevant to the lives of young people. To promote student engagement, identities of the eminent individuals were disguised.

My students/teachers and I experimented with a variety of strategies, and settled on the one described as follows: students worked in triads: a playwright/director and two actors, one playing the part of the young person, and the other actor taking on the role of a significant other involved in the critical incident. The three collaborated on drafting an initial dialogue. The actors rehearsed their lines and then discarded the scripts as they improvised the scene, with the playwright/director noting possible dialogue improvements. The process was repeated several times until the triad agreed that it was ready to share. In the debriefing sessions, we identified issues related to talent development as well as the possible future effects of different conclusions. As the last step, we shared the identities of the individuals, and their courses of action.

Earlier in this chapter, I sketched a critical challenge these individuals each faced as a creative individual. Below I include a transformation of that critical moment into a Playback Theater starter.

Maya Angelou Wants to Work

It was World War II, and there were many opportunities for Black people to be hired in jobs that had been closed to them. Maya had been an excellent student, but she was fifteen now, and her family needed her to work. Besides, she was bored in school.

She was attracted to the neat blue serge uniforms of the streetcar conductors, and the power they had—making change and clanging the streetcar bell. But no Black person had ever worked for the Market Street Railway Company in San Francisco. Even Maya's mother who "liked to speak of herself as the original 'do-it-yourself girl,'" thought she should try something else. Years later, Maya wrote in *I Know Why the Caged Bird Sings*, "She rejected the proposal with: 'They don't accept colored people on the streetcars.'"

Maya wanted so much to be a Conductorette! But her mother was nearly always right. And she needed her mother's support until she made enough money to live on her own (Angelou, 1969, 1997).

Mary Cassatt's Career Plans

The year is 1860; the place, suburban Philadelphia. Mary Cassatt's family has gathered around the long mahogany dining table to watch Mary blow out the candles on the towering Philadelphia white mountain cake marking her 16th birthday. Mary felt the deep warmth and affection of her family. This must be the moment to share her hopes and dreams about becoming a professional artist.

Her words spilled out as Mary tried to tell her family about her ambition to make something of her talent, to become an artist they could all be proud of. Why, even strangers might buy her paintings—they could even hang on museum walls!

Mary finally noticed her parents' ominous silence, and the shock on her brother Gard and sister Lydia's faces. Only Aleck was listening sympathetically. Mary managed a smile. Resolutely she went on, looking at her father. "Since it is impossible for me to do all this at home, I want your permission to go live in Paris, where I can study seriously and become a professional artist."

"I would almost rather see you dead!" declared her father. "It is unthinkable that any woman would propose to take up painting as a serious pursuit—and for money! Certainly no daughter of mine will be permitted to go off alone to Paris with such outlandish ideas" (Denenberg & Roscoe, 2006).

Sandra Day O'Connor and the Long Bus Ride

Because she was so homesick living with friends in El Paso, the Days decided to enroll Sandra at the local school in Lordsburg for eighth grade. The school was over 22 miles away and required that the Days meet the school bus on the highway before daylight and after dark in the evening during the winter months. Sandra had no chance to stay after school and no time to do much homework either. Which was more important—to live with her family or to have the chance for a full educational experience? (Abrams, 2009).

Sarah Winnemuca Chooses a Future

As the child of a chief, Sarah Winnemucca (1844–1891), a native of the Paiute tribe, grew up in a family of leaders. By her late teens, Sarah was referred to by the Europeans immigrants as "Princess Sarah" because of her appearance and communication abilities. She was accepted by both worlds.

Sarah has to decide if she will remain in the world of the settlers by marrying a settler, as her sister Elma did, and leading a respected, more comfortable life, by turning her back on her tribe. On the other hand, she could return to her tribe's reservation and try to intervene on their behalf with the government, the army, and other tribes. In the process she could lose the chance to make things better for her tribe—and maybe her life as well (Rosinsky, 2006).

Susan B. Anthony: Sewing or Cyphering?

It was about 1830. Susan and her sisters were going to a nearby school. They learned to read and write, as did the boys. But when the time came for the boys to study arithmetic, the girls practiced sewing.

One day, Susan approached her teacher and asked if she could learn long division along with the boys. He laughed loudly and said "Nonsense!" Susan disagreed, saying "If they can learn it so can I!" He replied "Girls' brains aren't suited for such hard work with numbers. You would only fail and be the laughing-stock of the class. You wouldn't want that, eh? It would be better for you to concentrate on learning what is proper and fitting for young ladies" (Kendall, 1997).

Charles Darwin: Medicine or Ministry?

Charles Darwin's father was a well-respected English physician. A strong-willed man, he expected his sons to follow the career path he blazed for them and to eventually join him in his very successful medical practice. But by the time Charles finished his first term in medical school, he realized that he disliked medicine. Charles liked to study nature: bugs, plants, birds, rocks—and just about anything else in the outdoors.

Charles knew that if he continued in medical school and became a doctor, he would be a wealthy and important man. Coming from an influential family as well, as a physician his future in the upper crust of society was secure. In this world, though, the study of nature was not considered to be important or valuable. In fact, the only way to study the natural sciences was to join the clergy. Members of the church were expected to study nature in all its forms in order to properly appreciate God. But Charles wasn't particularly religious. The prospect of becoming a minister was equally unappealing.

The winter holidays were fast approaching. When Charles went home, his father would expect a full report on Charles' progress and career plans (Hopkinson, 2005; Patent, 2001).

In Conclusion

In many cultures, an individual's life is represented as a spiral, marking the circuitous nature of personal development. In *Culture Tales*, George S. Howard (1991) makes the point that as humans, "we are in the process of creating value in our lives—of finding the meaning of our lives. A life becomes meaningful when one sees himself or herself as an actor within the context of a story—be it a cultural tale, a religious narrative, a family saga, the march of science, a political movement,

and so forth." (p.196) My hope is that using processes such as the ones described in this chapter energize and feed that process, that as our students develop their stories of self, they collectively create a "story of us" (Ganz, 2009) that promotes, energizes, and sustains individuals and their communities.

As teachers, using creative teaching practices such as the ones described in this chapter require rethinking our roles. We can no longer remain distant and detached from our students' personal struggles. Although the following assertion is written for a different context, its message is just as pertinent for teachers:

Narrative medicine suggests something revolutionary—that we need to stay in touch with our emotions and develop what Jack Coulehan calls "emotional resilience," which he defines as "being able to function in a steady or objective fashion, while also experiencing the emotional core of physician-patient interactions." That is, we can only fulfill the promise of patient-centered care if we let down our defenses... If it's true that "stories are antibodies against illness and pain," then, with the insights of this new discipline, we have a chance to truly become physicians healing ourselves (Divinski, 2007).

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Chapter 12
Designing Creative Assignments: Examples of Journal Assignments and a Creative Project

Heather T. Snyder

As teachers, we want our students to be creative because we know that creativity has benefits for the individual that go beyond those of societal innovation. Everyday creativity has been associated with physical and mental health, well-being and life satisfaction, and everyday problem-solving [see Richards (2007, 2010) for reviews of this literature]. Whether people are creative in any given task depends on multiple factors, including knowledge (and other "domain-relevant skills"), their use of "techniques" to enhance creativity (such as thinking "outside the box," taking risks, and other "creativity-relevant skills"), and motivation (especially "intrinsic task motivation") which can be influenced by external factors like instructions and grading (Amabile, 1996). Students' conceptions of creativity (such as that people are either born creative or not, and creative people are able to generate fully formed creative ideas quickly and easily) may also influence whether they are creative (e.g., Lemons, 2010; Plucker & Dow, 2010; Sawyer, 2012). These conceptions of the creative process often differ from the research evidence [e.g., see a recent review of research on the creative process by Ward and

Author Note: This chapter is based on my presentation that was part of the *Teaching Creatively: Examples from the Teaching of Psychology of Creativity* Symposium at the 2010 American Psychological Association Annual Convention, San Diego, CA. I am very grateful for the wonderfully supportive responses I received at the Convention. I thank everyone who shared their ideas in response to my post to the electronic mailing lists for APA Division 2 and APA Division 10 on April 6, 2006 requesting suggestions for my (at the time) new course. The discussion threads inspired me to go further in my consideration of creative assignments. The assignments discussed in this chapter build upon and synthesize various suggestions and published examples; any unidentified similarities are unintentional. Finally, I thank my students for their feedback.

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Kolomyts (2010)]. As an instructor for a course in Psychology of Creativity and the Arts, my goals include to challenge my students to critically examine their own conceptions of creativity and to encourage them to consider "techniques" that may help them to be more creative in their work in whatever domain they choose. I developed creative assignments to help my students do this.

When preparing to teach a new course in Psychology of Creativity and the Arts, I was inspired to investigate and develop creative assignments for my course that went beyond the self-reflective journal entries and the traditional research term paper. This led to the development of two types of creative assignments for my course: creative journal assignments and a creative project. These assignments were evaluated at the end of every semester, and I revised the assignments based on these evaluations. In this chapter, I define creative assignments and discuss their benefits. I describe the assignments I developed for my course as examples. I conclude by briefly considering how the creative assignments may contribute to students' creativity.

Defining Creative Assignments

The commonly used definition for creativity is "the interaction among *aptitude*, *process* and *environment* by which an individual or group produces a *perceptible product* that is both *novel and useful* as defined within a *social context*." (italics in original; Plucker, Beghetto, & Dow, 2004, p. 90). Therefore, creative assignments are tasks students complete to promote or evaluate learning that include processes or products that are new and appropriate for the classroom or course. This novelty could be from the perspective of the teacher generating nontraditional assignments that are appropriate for enhancing or evaluating learning or developing a skill (including experiential learning and other active learning techniques). This novelty could also be from the perspective of the student who is completing a product that is new and appropriate for the assignment.

In her introduction chapter for a book on creative assessments, Gayton (2007) wrote that assessment should have clearly identified and attainable objectives, and should be "fully integrated into the unit of study relating directly to the theoretical and practical components of the course" (p. xix). Creative assignments can be used across the educational lifespan, in all disciplines, and can have different objectives. For example, some use creative assignments as a means to teach and/or illustrate course concepts (e.g., Burgmayer, 2011; Goma, 2001; Good & Moss-Racusin, 2010). Others use these assignments for students to demonstrate or document learning of course concepts and/or what they did in the course (e.g., Cole, 1990; H. Leff, personal communication, April 12, 2006). Creative assignments may also be used to develop practical skills, such as working with difficult patients (e.g., Shapiro & Lie, 2000) and/or empathy (e.g., Cook et al., 2006/2007; Chrisler, 1992) or to address overall professional development (e.g., Rucker & Shapiro, 2003). Creative assignments are also used to promote critical and creative thinking or discipline-specific thinking (e.g., Blue, 2006; Carkenord, 1994; Connor-Greene,

Young, Paul, & Murdoch, 2005). Some instructors include creative assignments to specifically encourage their students to have fun (e.g., Blue, 2006). Furthermore, many of the cited examples include self-reflection and applying course concepts to everyday life as objectives.

Creative assignments can be integrated into classes in multiple ways. For example, creative assignments can be semester-long creative projects (such as writing poetry or stories) or short frequent tasks (e.g., Ellis, 2005; Mezeske & Mezeske, 2007). Journal writing is an example of short frequent tasks that may include self-reflections (e.g., Hettich, 1990), creative applications of course concepts to observed examples (e.g., Connor-Greene, 2000), or creative exercises to induce further consideration of course topics (e.g., J.S. Omarzu, personal communication, April 7, 2006). These assignments can be required (e.g., Halpern, 2010), one of multiple options for a required assignment (e.g., Burgmayer, 2011) or extra credit (e.g., Connor-Greene et al., 2005). Creative assignments may be graded (e.g., Goma, 2001) or not graded (e.g., Domino & Wechter, 1976). Some authors report minimal grading (small number of points that would not have a large impact on student grades) to encourage intrinsic motivation and taking risks (e.g., Halpern, 2010).

Benefits of Creative Assignments

Research suggests that benefits of using creative assignments may include increased student engagement, motivation, and satisfaction (e.g., Malouff, Hall, Schutte, & Rooke, 2010). Enjoyment and pride have been shown to correlate with motivation, effort, and academic performance (with boredom negatively correlated with these outcomes; Pekrun, Goetz, Titz, & Perry, 2002) and students typically report enjoyment of creative assignments. Active learning assignments have been shown to correlate with greater student engagement with course content although not necessarily enjoyment of the course content (e.g., Smith & Cardaciotto, 2011). Students who reported engagement with course content also reported increased learning and memory of this course content (Frick, Chadha, Watson, Wang, & Green, 2009; Smith & Cardaciotto, 2011). Using creative assignments also likely reduces the possibility of plagiarism because assignments are designed to be unusual (not the traditional term papers; Cummings, 2003). Therefore, students cannot copy and paste from references to complete the assignments; students also cannot easily obtain completed work for the assignments from the Internet or other sources.

Journal assignments in particular have been shown to result in increases in some types of self-knowledge (for example, application entries increase understanding of behaviors; Miller, 1997) and meta-cognition (e.g., Hettich, 1990), increases in self-efficacy (Fritson, 2008), and increases in learning (such as when entries involve applying personality theories to fictional and nonfictional characters; Connor-Greene, 2000). Cisero (2006) noted that the effect of journal writing on academic

performance likely depends on the content of the journals (how they relate to the course content tested on exams), students' engagement and motivation (many students reported that the journal assignments were "busywork"), and their ability to self-reflect. Hettich (1990) also found that not all students were equally able to write appropriate journal entries. Hettich (1990) did find that students reported that journals "stimulated critical thinking" (p. 38). He also found that students overwhelmingly preferred journal entries to term papers because of the variety, self-focus, and short frequent writing involved in journal writing, and because students found journal writing more interesting than term papers.

Gayton (2007) stated that assignments should be "effective, fit for purpose, worthwhile, and efficient" (p. xviii). I carefully considered these criteria when developing my creative assignments. The Psychology of Creativity and the Arts course is a general education course and students typically have diverse backgrounds in majors and coursework (and interest and involvement) in psychology and arts. Since there are so many benefits to creative assignments, and journals in particular, I worked to develop appropriate assignments that would include short, frequent, minimally graded tasks that would allow students to experience concepts before class discussion (journal assignments) and a term project that would allow students to consider (and experience) course concepts after class discussion.

Journal Assignments

Journal Rationale and Objectives

As indicated above, many instructors include journal assignments in their courses in a variety of content areas. While those journal assignments I surveyed typically included self-reflection tasks, I learned to be wary of student disclosures as an instructor of Developmental Psychopathology. I wanted to use the journal assignments as learning tools to illustrate course concepts and initiate class discussions about the related research, especially to challenge students to think critically about their own conceptions of creativity. Recent research suggests that journals as traditionally assigned (i.e., reflective writing about readings or concepts) may not be perceived as worthwhile by many students (e.g., Cisero, 2006) and one way to address this may be to make the assignments more practical and creative (e.g., Mills, 2008). Therefore, I developed assignments that fit these characteristics. The objectives of the journal (listed at the top of the assignment handout) include to serve as a learning tool to consider course material; to apply this material to students' own work by showing practical everyday examples of course concepts "in action"; to help meet course objectives; to provide a record of what they did for the course, what they learned, and their growth over time; and to allow students to take an active role in their learning.

Journal Description

Students are required to purchase a sketchbook for these assignments. There are eleven journal entries completed throughout the semester. The first assignment asks for the student's definition of creativity, and the last assignment asks the student to again provide his or her definition and note whether and how it changed, as well as his or her motivation to complete the journal assignments throughout the semester (to address intrinsic versus extrinsic motivation) and thoughts about the overall course. The next to last entry asks students to discuss their process and product for the creative project. One entry requires students to participate in an arts event (e.g., concert, play, gallery exhibit, museum exhibit) as an audience member and reflect on his or her experience and expertise in that domain. The remaining entries have two components (1) draw or write a creative product (to somehow engage students in completing a task that relates to a course concept) and (2) answer questions about the process and/or product that address the course concept that will be discussed in class the day the assignment is due. These entries were developed based on assignments of other instructors, measures/methods in creativity research, and anecdotes shared by others. These assignments are graded based on whether the product and question answers were completed. Each assignment is worth four points so no assignment substantially affects the student's grade in the course. Therefore, it is up to the students to decide how much time and effort to spend on each assignment (unless the assignment is timed). They do not have to share the journal assignments with their group or the class. It is expected that these assignments are low-pressure assignments, which hopefully allows students the space to "play with them." In class, students discuss in small groups what they did and their answers to key questions to give them a chance to see what others' experiences were like and to "gather their thoughts." Then I ask for volunteers to share with the class, and ask what answers they discussed. I use these discussions to lead into a lecture on the topic, using their responses during our discussion to illustrate or otherwise relate the course concepts.

An example journal assignment is as follows[1]:

Draw, paint, color (use line, shape, color) on a full page in your journal to represent how you are feeling while listening to your favorite song.

- Which song did you listen to for this assignment? Identify the song and artist?
- Did you notice any of the following while you were working on this task? Distorted sense of time—for example, not sure how long you were working ("lost track of time"); enjoyment of task while doing it; intense concentration; feeling challenged in a good way? If yes, which? How so?
- Have you ever experienced any of these things while completing a task before? When?

[1] Due to space limitations, I am only able to discuss one assignment here. If interested, contact me via email at hsnyder@edinboro.edu for the full journal assignment handout.

A colleague in the Art Department mentioned an activity from graduate school when his class was required to complete an artwork while listening to a writer share his writing (poetry? I cannot remember the details since this conversation happened years before I started this course). I found his experience fascinating and remembered it when developing journal assignments. I created this assignment for students to see if they experience "flow" (Csikszentmihalyi, 1990, 1997). Some students report experiencing the characteristics associated with flow, while other students report not experiencing these characteristics. This allows us to discuss what differs between the two experiences, and this then allows me to relate their experiences to the research regarding factors associated with flow. Each of the drawing and creative writing assignments follows this procedure and each addresses different course concepts.

Journal Feedback

I developed a course evaluation questionnaire to assess the creative assignments when the course became a formal course in Fall 2007. I have administered these questionnaires every semester the course was taught. I found that students repeatedly requested more journal assignments! While I did not want to add assignments since not all students wanted more (and some felt overwhelmed by the existing assignments), I developed a handout with recommended entries and additional exercises in Fall 2008 that students could do on their own or after the course. Like the required assignments, these were linked to course concepts and included questions directed at students' conceptual understanding.

Students continue to find the journal assignments interesting, enjoyable, and an overall useful task that meets the journal and course objectives (Snyder, 2012). Students found value in the assignments for working with course concepts, though some focused on the assignments as tools for enhancing creativity rather than for learning concepts. It does appear that students did not find these journal assignments to be annoying "busy work" as Cisero (2006) reported some students may think.

Project

Project Rationale and Objectives

The creative project was designed for students to consider their own ability to be creative and their own creative process (especially because students may believe that not everyone is born creative, fully finished ideas should emerge in a flash of insight, and constraints always decrease creativity; Plucker & Dow, 2010; Sawyer,

2012). I wanted my students to have an experience of completing a larger scale *creative* work that they would share with an audience (their classmates) as artists do. I also wanted students to work with constraints that would (1) be sure that their work was relevant for the course and (2) increase the variability of their responses (Stokes, 2010; so they would not do something that they had done before). I also wanted to reduce the likelihood that students would "borrow" from other students or sources. I already included application assignments in my other courses where students would apply course concepts to cases. This creative project emerged from a synthesis of the following (1) the special section on creativity of the *American Psychologist* issue that included applications of theory and research to eminent creators (Sternberg & Dess, 2001; students read three of these articles throughout the semester for reference and examples), (2) the discussion of the creative project provided by Domino and Wechter (1976), and (3) the poetry assignment described by Connor-Greene and colleagues (2005). Objectives for the project listed at the top of the project handout include to critically consider course material in application to a specific artist; complete a larger scale creative work; critically apply course concepts to personal creativity; and to increase and assess conceptual understandings of course material (by considering a different perspective and non-technical language).

Project Description

Students select a project format from the following three choices: children's book, comic, or poem/lyrics/spoken word performance. All projects must include an influential artist and a course concept in some way. Students have included the artist as a character, as a child or baby, represented the artist as an animal, or included the artist's interests or something significant for the artist's life or work, or the artist's style in their projects. The inclusion of the course concept can be explicit, such as providing a "lesson" with the words themselves, or less explicit with a description of the concept without the words, or indirect with an illustration or example of a concept represented in the illustrations and/or narrative. Guidelines were generated regarding length and size to facilitate sharing with a class of 35 students. All students present their projects to the class, and students complete an audience sheet to check their attention during these presentations. The project is broken down into four steps throughout the semester as a result of feedback in early versions suggesting that the task was too overwhelming in total: (1) the artist choice and library assignment (to start the work of identifying possible references and topics), (2) the application paper, where students select two concepts to apply to their artist, (3) the project critique where students bring drafts of their project to class for peer review, and (4) the final project and its presentation (and journal entries addressing what they did and why; and the influences of presenting to the class, of the critique, and of the constraints, and what they think of their final product). The projects are graded according to whether students met project guidelines, demonstrated appropriate conceptual understanding, and whether the project is "publish-ready."

Project Feedback

As with the journal, the project was revised in response to student feedback over time. For example, I originally had all students use one format (children's books in Spring 2007 and comics in Fall 2007). Students in these classes argued that choice of media would allow them to select a format they were most comfortable with, and they argued they should have a non-drawing option, so I added the choice, including the non-drawing option of poetry, lyrics, or spoken word performance. Students typically find the project to be interesting and enjoyable, that it contributed to their learning, and that overall it was a useful task that meets course and project assignment objectives (Snyder, 2012). While some students appeared resistant to the project at the start of the semester, they appeared to appreciate it after completing the project. Students often note in their journals that they did more creative work than they thought they could do at the start of the semester. However, not all students find that the project was beneficial. For example, students have noted that they find the journal entries contribute more to their learning, and that limited time to devote to the course resulted in less enjoyment of the assignment. Research suggests that students may struggle with the extra effort needed to complete active learning assignments (Smith & Cardaciotto, 2011). It appears that students find the project worthwhile, although some students may struggle with the time demands to do adequate work.

Conclusion

Students may believe that they cannot be creative because of their inaccurate conceptions of creativity (e.g., Lemons, 2010). Creative assignments can challenge these conceptions and give students the opportunity to develop domain-specific and creativity-relevant skills (Amabile, 1996) and do creative work. For example, they develop domain-specific skills by completing preparation tasks like researching concepts (such as which concepts can apply to the project artist), what has been done before (such as reading children's books for examples), or techniques to use in the assignments (previous students have researched poetry formats and painting techniques for their projects). They develop creativity-relevant skills by recognizing the processes needed in order to do creative work, such as taking risks and considering different ways to approach problems (especially when encountering constraints). Finally, creative assignments allow students the opportunity to find a balance between their own intrinsic motivation and the extrinsic demands (the assignments are required and graded) in order to produce creative work. Creative assignments may influence students' conceptions about creativity, which in turn may enhance their creativity and influence future creative behaviors (for example, I was recently informed that two former students asked to do creative projects using my project guidelines for a course in a different non-arts discipline!).

I continue to develop my assignments as a result of student feedback, reading the literature, everyday experiences, and collaboration with colleagues. Sternberg (2010) argued that teachers who want to enhance creativity in their students should serve as role models. In this way, the definition of creative assignments from the perspective of the teacher is important. I try to model creative thinking in my development of assignments in multiple ways, such as by being flexible and open to new ideas, taking risks, and "thinking outside the box." Therefore, by serving as a role model for my students, I hope to be a creative teacher who teaches creativity.

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Chapter 13
Teaching for Creativity: Domains and Divergent Thinking, Intrinsic Motivation, and Evaluation

John Baer

For a APA 2011 symposium on Teaching to Enhance Creativity in Students

Introduction

Creativity matters, and it matters for many reasons. It can easily be argued that creativity matters because the world will be a better (happier, more productive, more interesting) place if people are more creative. I think that's true, but I think the only argument that needs to made is that creativity—doing creative things, thinking creative thoughts, responding to the world in a creative way—is one of the primary things that make life worth living. Developing students' creative thinking skills is not the only function of education, but I trust anyone reading this chapter does not need to be convinced that it is one important thing schools should be doing. This chapter explains two things teachers should know if they want to be effective in developing the creative thinking skills of their students: the domain specificity of creativity and the impact of extrinsic motivation on creativity. I explain each of these ideas briefly and suggest ways teachers can apply these insights in their regular classroom teaching.

Domains and Divergent Thinking

Everyone agrees that to some extent creativity is domain specific—there is at least some difference in the creativity-relevant skills needed to make wonderful symphonies, wonderful sonnets, and wonderful soufflés—but the question of just

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how domain-specific creativity may be is an open one. The purpose of this part of my paper is not to argue for domain specificity or to review the evidence for domain specificity, which I have done elsewhere (see, e.g., Baer, 1993, 1998b, 2010). My goal is rather to show two things (a) the answer to the specificity/generality question has serious implications for how best to develop divergent thinking and other creativity-relevant skills and (b) unless one is certain that creativity is almost entirely domain general, assuming domain specificity when creating creative thinking exercises is much safer and wiser because nothing is lost if it turns out that domain specificity is false, whereas assuming domain generality carries high risks that much of one's divergent thinking (or other creative thinking) training efforts will be for naught.

To explain these things, I will make each assumption in turn—that creativity is largely domain general, and that it is largely domain specific—and then examine the implications for divergent thinking training. Then we can evaluate the consequences if it should turn out that the *opposite* assumption is the correct one. (Note: Because the same conclusions would be true for other kinds of creative thinking training, I will focus here on divergent thinking, which is the most common kind of training used to improve creative thinking. The arguments could be easily generalized to other kinds of exercises aimed at improving creative thinking skills, however.)

1. If one assumes that creativity is domain general, then whatever creativity-relevant skills one acquires should positively influence creative performance in all domains (just as domain-general intelligence—*g*—is expected to influence intellectual performance across all domains, so if one had a way of increasing a student's *g,* one would presumably increase that student's intellectual skills and performance across domains). This is not to say that domain-specific knowledge would not still matter: one would still need to know a great deal about music to write a symphony, and one would need to know very different kinds of things to write a sonnet or create a soufflé. But just as *g* is expected to influence performance in math, writing, and many other areas, domain-general creative thinking skills should influence creative performance across domains.

If one were teaching or practicing a truly domain-general creative thinking skill, then it would not matter the content one used for such practice (unless the training also included some domain-specific knowledge-acquisition component, of course). So if one were going to have students do a number of divergent thinking exercises to increase their domain-general divergent thinking skill, it really wouldn't matter the content of those exercises. It would not matter at all whether one practiced by brainstorming unusual uses for a brick, words that rhyme with June, or things that taste like chicken. The effect would be the same—an increase in divergent thinking skill that would be equally applicable in any domain.

If creativity were domain general, this would present no problem. But what if creativity (and creativity-relevant skills, such as divergent thinking) are actually very domain specific? If the content of the divergent thinking exercises matters, as would be the case if creativity were domain specific, then training that employed divergent thinking exercises with one type of content would be expected to improve

creative performance *only in that domain*. (In fact, this is exactly what happened in one experiment I did (Baer, 1996) in which middle school students were led through a variety of poetry-relevant divergent thinking exercises. They later wrote both poems and short stories. Expert judges who were unaware which students had been trained judged the poems of the trained students to be significantly more creative than those of the untrained students, but the training had no observable effect on the creativity of the students' short stories.)

It is perhaps not surprising that training based on an incorrect theory would not produce the results predicted by that theory. Under domain generality, one might select any content at all for creativity training activities (such as divergent thinking exercises), and if creativity should turn out to be domain general, then nothing would be lost by making that assumption. But if creativity turns out to be domain specific, then the choices one might make based on an incorrect theory of domain generality would not work as well.

Perhaps the same will be true if one is guided by domain specificity?

2. If one assumes that creativity is domain specific, then creativity would be enhanced only in the areas in which the creativity training is focused. If one wanted to increase poetry-writing creativity, then the creativity-relevant skills one needs to learn would be specific to poetry, and one would need to learn different creativity-relevant skills to increase creative performance in other domains. So if one were having students do a number of divergent thinking exercises to increase creativity in one domain, those exercises would need to be targeted for that domain (and as noted above, this has been shown to work). Conversely, if one wanted to increase creative performance in many domains, one would need to choose divergent thinking exercises that used content from a wide variety of domains.

No surprise there: If a theory is correct, then training based on that theory should be effective. But let's turn the tables again. What if one based one's selection of divergent thinking training exercises on a belief in domain specificity, but this theory was later shown to be wrong and in fact creativity was found to be mostly (or even completely) domain general? Would the training now be less effective, as we saw was the case if one assumed domain generality and that assumption proved false? No, not at all—it would not matter in any way! Recall that under domain generality, it didn't matter what content one chose for divergent thinking training. So even if domain specificity were completely false, there would be no harm whatsoever in being guided by it in designing creativity training exercises. Such training would be just as effective regardless which theory turned out to be correct.

Consider this parallel argument from the more mundane domain of laundering clothes. One could argue in favor of separating colorful fabrics from whites and then laundering them separately (let's call that color specificity), or one might argue that it makes no difference and all fabrics could be laundered together (color generality). If one assumes color specificity and therefore separates colorful fabrics and whites for laundering and it turns out that color generality was right and one's assumption of color specificity was wrong, it turns out not to matter—all one's clothes will still come out just as clean. But if one assumes color generality and launders all fabrics together and then it turns out that color specificity was true (and

colorful fabrics do indeed bleed), then one might end up with some unhappily colored, formerly white clothing. Assuming color specificity carries no risks (although it is more work to separate one's clothing), whereas assuming color generality carries a very large risk.

The moral of the story? As long as it is uncertain the degree to which creativity is domain specific, it will always be wiser to assume domain specificity as a creativity trainer. If creativity is domain specific, then the kinds of content one chooses for divergent thinking training matter, whereas if creativity is domain general, then the choice of content doesn't matter at all. In the absence of certainty, there is no reason not to assume domain specificity and much reason to avoid an assumption of domain generality (Baer, 2011).

Intrinsic Motivation and Evaluation

Amabile (1983, 1996) has made what to many is a convincing case that extrinsic constraints like rewards and evaluations depress creativity. This claim has become somewhat controversial (see, e.g., Eisenberger & Cameron, 1996; Eisenberger & Shanock, 2003; and Eisenberger & Rhoades, 2001), and my own research has found a bit of unexpected middle ground by showing that the effects of extrinsic constraints appear to lower the creativity of girls far more than boys, a difference that first appears in middle school (Baer, 1997, 1998a). But as with the domain specificity issue, it is not my purpose here to argue that case or weigh competing evidential claims. My goal in this section of the chapter is merely to suggest strategies for lessening the possible ill effects of evaluation on creativity, especially in the area of creative writing (although the same techniques could be easily adapted for use in many other fields as well, such as art).

If students are to improve their writing skills, they need feedback, which is another way of saying that their work must be evaluated in a meaningful way. But if the anticipation of evaluation leads to diminished creativity, as Amabile's research suggests, then teachers are put in an seemingly inescapable bind. They must either stunt their students' creativity by providing constructive feedback or impede the development of their writing skills by failing to provide such feedback.

Amabile's research suggested one partial solution to this conundrum. Feedback that focuses on the work itself (e.g., "This dialogue moves the story along well here" or "This dialogue is rather stilted") appears to be less harmful to later creative performance than feedback that focuses on the student's abilities (e.g., "Your use of dialogue here shows you have real writing talent"). When the focus remains on the work and not on the abilities of the student who created that work, the negative impact of evaluation is lessened. (It is interesting that this distinction somewhat parallels one found in the work of Carol Dweck and her colleagues (Dweck, 2006; Mangels, Butterfield, Lamb, Good, & Dweck, 2006; Mueller & Dweck, 1998). Dweck has shown that feedback emphasizing effort rather than ability leads students to take on greater challenges and to focus more on learning than on grades.

This seeming correspondence between these two unrelated lines of research is intriguing, although it is not at all clear that the two sets of findings are linked in any way. Perhaps future research will investigate this possible linkage.)

So when evaluating students' writing, it is wise to provide feedback about the writing itself, not about the students' abilities as writers, but unfortunately that shift in emphasis does not remove all the seemingly creativity-inhibiting effects of evaluation. At some point, Amabile's research forces us to confront two opposing forces, those that foster creative performance (by de-emphasizing extrinsic constraints like evaluation) and those that foster skill development (by providing regular evaluation). How is a teacher to choose?

Rather than try to do a little of each all of the time—which is unlikely to be effective, because if Amabile's research shows anything it is that extrinsic constraints tend to overwhelm intrinsic constraints—teachers might follow both approaches, but at different times.

Students need feedback on their writing, and they should expect feedback on many (probably most) of their writing assignments. So if students are learning how to write dialogue (or simply how to use the punctuation employed in writing dialogue), teachers should let them know that this will be evaluated. In doing this, teachers should understand that the creativity of the stories students write may be somewhat compromised as an unfortunate result of such anticipated evaluation, but at the same time know that, in order for students to learn skills they will need to write more creatively later on, they need to improve these skills now.

But not every writing activity needs to be evaluated. The negative impact of evaluation, according to Amabile (1983, 1996), is that it lowers intrinsic motivation. Many students enjoy writing and find it personally meaningful—that is, they find it intrinsically motivating—and there is a real danger that evaluating *everything* they write will lead to a long-term lessening of that intrinsic motivation. Such unrelenting evaluation may turn something that is intrinsically interesting and engaging and meaningful to students into something that is just work.

To prevent this, teachers can sometimes assign writing activities that will *not* be evaluated in any way (not even in some secret grade book!). This must be made clear to students in advance if it is have any effect, of course—otherwise, they will simply assume that this assignment will be evaluated, like all other assignments. And students may not fully trust this evaluation-free promise the first time or two. But if teachers are consistent in not grading or otherwise evaluating students' work when they say they will not evaluate it (beyond perhaps acknowledging the students' work by saying that they enjoyed reading the stories), this will free up students who might otherwise feel constrained by the expectation that their work was going to be judged; it might allow them to write in a more risk-taking, experimental, intrinsically motivated way. And it might encourage, rather than discourage, their intrinsic interest in writing.

Will some students abuse such freedom? Of course they will. Some students will test their teachers to see just how little they can get away with. But that's a risk worth taking. If for every student who essentially wastes this freedom by writing the

shortest story he can imagine, another student will use the freedom to write something she might not have attempted otherwise (and in doing so, her intrinsic motivation for writing will be nourished). This will make it easier for students who love writing for its own sake to deal with the extrinsic constraint of evaluation in other writing activities, and at the same time make students more aware of the need to build writing skills so they can achieve all they want to achieve with their writing. And the student whose creativity is focused, when freed from the constraint of evaluation, on seeing how little work he can do and get away with it? No matter. Many if not most other writing activities will be evaluated, so that student will still need to learn to write. He will simply be missing some opportunities to do something more interesting.

Conclusion

Most teachers want to help their students develop their creative thinking skills. Unfortunately, some of those efforts may come to naught, or even be counterproductive, if teachers misunderstand the domain-specific nature of creativity and the impact that extrinsic constraints like rewards and evaluations can have on creativity. By keeping in mind (a) the need to practice creative-thinking skills in many diverse domains (all the domains in which one hopes to nurture creativity) and (b) the importance of promoting students' intrinsic motivation (and not inadvertently undermining it by offering unnecessary rewards for doing things students already find intrinsically motivating), teachers can help students grow as creative thinkers—and they can do this without sacrificing the need also to promote the acquisition of content knowledge and skills (Baer, 2002). Creativity is not the only important thing schools need to nurture, but it is one important part of their mission. Understanding how to use the domain specificity of creativity and the impact of different kinds of motivation on creativity will help teachers do this part of their job more effectively, more productively, and more creatively.

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Part IV
Conclusion: Creative Teaching of Creativity

Chapter 14
A Potential User's Personal Perspective

Dean Keith Simonton

The various chapter authors have often addressed issues very close to my heart. Besides teaching courses on both creativity and teaching, I have published two articles on both teaching creatively and teaching creativity.

In the first article, I introduced some creativity into the teaching of the History of Psychology by devising a novel term paper assignment (Simonton, 1994). Rather than have undergraduates regurgitate half absorbed "names, dates, and places" regarding psychology's past, the students are asked to integrate extensive biographical knowledge about a key figure in the discipline's history with what creativity researchers have learned about the scientific genius. In other words, creativity research was used to provide a profile of the cognitive, personality, developmental, and sociocultural factors associated with scientific discovery, and then some eminent psychologist is compared against that empirical framework. For example, to what extent did Freud, Pavlov, Piaget, or Skinner have the psychological characteristics comparable to Galileo, Pascal, Newton, or Darwin? Naturally, students had to obtain their knowledge of scientific creativity from some comprehensive review of the extensive literature. I did not shy away from having them use one of my books on the subject, starting with *Scientific Genius* (Simonton, 1988) and later turning to *Creativity in Science* (Simonton, 2004). The result has been highly successful. I get my highest teaching evaluations for this course, sometimes even getting perfect student ratings. This course was so well received that I later introduced the same broad approach into a graduate-level history course, this time using *Great Psychologists* (Simonton, 2002) as a more advanced review of the applicable creativity research.

The second article was published in the same journal as the first, namely, *The Teaching of Psychology* (Simonton, 2012b). I was asked to contribute an article on creativity to "The Generalist's Corner," a section devoted to providing brief

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reviews of a major substantive domain for use by instructors of introductory psychology courses. I jumped immediately at the opportunity largely because—as I am sure many creativity researchers know too well—creativity is not always covered very well (if at all) in many introductory textbooks. Indeed, I have had reviewers of manuscripts submitted to mainstream journals explicitly state that creativity is not of sufficiently broad interest to be suitable for publication! In any case, although most of the article was relegated to reviewing "current findings, trends, and controversies," I ended the essay with a brief discussion of how I teach creativity more creatively. For instance, I mention my wardrobe full of t-shirts specifically designed to evoke curious attention in the students taking my Genius, Creativity, and Leadership class. Although students know in advance that the images on these t-shirts will invariably have some relevance to the lecture, it is not always obvious what the connection might be despite the fact that they have the lecture notes in advance. For example, later in the same day that I am writing this very sentence, I am thinking about my t-shirt for today's lecture on Cox's (1926) classic study of 301 geniuses. Hmm . . . I think it will be one of my Leonardo da Vinci shirts. But, why? No, it's not what you first guessed!

The above two publications suffice to show that I wasn't selected at random to write the final chapter of this volume. However, because the chapters are so diverse in approach and content, writing an integrative chapter was no easy task. Therefore, I have decided to emphasize a specific, more egocentric perspective: How can I use this book to improve my own teaching? In addressing this issue, I will focus on the five chapters in Part II, which have to do with teaching creatively, and the additional five chapters in Part III, which are concerned with teaching for creativity. In the latter case, however, I will have occasion to mention one of the chapters in Part I.

Teaching Creatively

Unhappily, even my most recent article was written before I had the chance to read the chapters in this volume. As a result, the article is already out of date! Certainly, Chap. 6 on teaching survey-level psychology courses at liberal arts colleges is highly relevant. Many of the techniques he suggests I have also found highly effective, such as the use of music, a device that remains useful when teaching upper-division creativity courses. To illustrate, the day that I lecture on artificial intelligence and computer simulations of creativity, the students hear a piano rag as they walk into the room and settle into their seats. I then ask the class at the beginning of the hour if they recognize the piece, or at least the composer. Although students invariably guess that Scott Joplin must be the composer, none can guess the composition correctly. Imagine their surprise when I inform them that they also guessed the composer wrong! Then, after more than 45 min discussing the successes and failures of computer creativity, I end by mentioning David Cope's (1996) EMI ("Experiments in Musical Intelligence") computer program that endeavors to create *new* compositions by *old* (a.k.a. dead) composers. My students

are of course skeptical, but somehow I always run out of time to discuss the details, so I play the music they heard at the beginning of the hour, telling them as they leave the classroom that EMI was the rag's composer. That's why Joplin wasn't the composer and also why nobody could identify the piece!

Because I teach a two-quarter professional course on the Teaching of Psychology in which the graduate students teach General Psychology in the second quarter, this chapter would necessarily provide a valuable addition to the "Resources" section of the course website (http://psychology.ucdavis.edu/Simonton/p390wmain.html). To be sure, Solomon's chapter is the only one in Part II that specifically deals with a subject that I teach or teach how to teach. The other chapters branch out in various directions. Thus, Chap. 9 deals with training programs in forensic psychology, while Chap. 8 discusses the teaching of music theory. Other treatments expand out to cover science learning in high school (Chap. 5) and the use of creative entertainment in teaching students in graduate and professional schools (Chap. 7). Although the specific applications might be misinterpreted as too restricted to a particular disciplinary subject and student population, such a narrow assessment would be most unfortunate. With a little creative imagination, an instructor can adapt or apply similar methods to other subjects and populations. Certainly, video games, film clips, personal stories, experiential exercises, mock reality shows, webinars, and other techniques are potentially applicable to almost any venue.

In fact, one of the surprising experiences that I have encountered in teaching the Teaching of Psychology is how creative my graduate students can be when teaching General Psychology for the first time. Having grown up with the internet, they are much more open to its possibilities. It is rare that a student lecture that does not include some instructive YouTube audiovisual, and some of these are strikingly creative. For instance, one of my student teachers found a choreographed representation of how sodium and potassium ions undergo their exchanges as an action potential travels down an axon! In addition, growing up with hypertext may make them more willing to venture departures from the linear progression that so often dominates introductory textbooks. The laptop then becomes a bag of tricks that helps engage the students in a more active learning process.

Teaching for Creativity

Part III features chapters addressing a very different question: Not how to teach creatively but rather how to teach for creativity. As Grohman and Szmidt (this volume) make clear in their Part I chapter, the second question may be the more important of the two. Creative teaching may make a course and its contents more memorable, but teaching students to exhibit more creativity may have broader and more durable consequences. The chapters in Part III provide additional examples. Again, the illustrations represent a diversity of target populations, from teachers to students at different levels. Moreover, the techniques can range from planning creative class assignments (Ranjan and Gabora; Snyder) to taking opportunistic

advantage of unscripted classroom moments (Beghetto). From reading these chapters, it becomes evident that creative teaching is not required in teaching for creativity. Indeed, once an instructor identified a set of teaching techniques that were guaranteed to make students more creative, it seems to make the most sense to implement these methods routinely throughout the rest of the instructor's career. Alternatively, does a dialectic contradiction hide here somewhere?

Because I am approaching these chapters from the standpoint of a potential knowledge consumer rather than as a knowledge producer, I immediately gravitated to the essays by Snyder and by Ranjan and Gabora. Both specifically discuss teaching an undergraduate course on creativity, Snyder especially so. As said earlier, I regularly teach a Genius, Creativity, and Leadership class that, like Snyder's Psychology of Creativity and the Arts, is a general education course. For me that's not a particularly good thing because my university imposes severe and precise constraints on the course's design, particularly because it also fulfills the expository writing requirement (e.g., "writing in the discipline"). Somehow listing the *Publication Manual of the American Psychological Association* (APA, 2009) as a required text alongside *Genius 101* (Simonton, 2009) invites their mutual annihilation like a colliding electron and positron. In any event, the academic "powers that be" have ruled out a priori many of the chapters' suggestions for creative assignments. I can only hope that other instructional techniques, such as my use of cartoons, music, t-shirts, the course website, and regular emails about current events induce some modicum of creativity (if not genius or leadership) in my students. The closest I have so far come to a creativity-inducing technique is to post a "term paper topic generator" (viz. located at http://psychology.ucdavis.edu/Simonton/TermPaper.html). I jokingly tell my class to print the page out, tack it on a corkboard, and, blindfolded, throw two darts, one at the independent variable column and the other at the dependent variable column. Before adding this page to the course website far too many of the term papers were on just two topics—gifted education and the mad genius. Now a much larger proportion of the papers are on topics that are totally new. Because I've been reading these term papers for more than 20 years, that increased creativity is most welcome!

I so far haven't mentioned Chap. 14 because it really examines a very broad problem, namely, whether teaching for creativity needs to be domain specific. As the author says, creativity researchers still disagree about the degree of domain specificity in creativity. My own position is that this debate merely reflects a false either-or dichotomy that too often plagues psychology (Simonton, 2000). Creativity entails both general processes and domain-specific knowledge and skills hopelessly intertwined (Simonton, 2007). Teaching people to be creative in the arts will not be equivalent to teaching them to be creative in the sciences, but neither will the instruction techniques be mutually exclusive.

The analogy that I like to use is teaching languages. Does the teacher of basic German behave differently than a teacher of basic Spanish? Well, of course! The German and Spanish tongues have radically different alphabets, phonetics, lexicons, grammars, and expressions. That said, do the broad principles of foreign language learning apply equally to both German and Spanish. Again, of course!

Specific learning tasks will be seen in both, such as (a) mastering the discrimination and production of essential and often novel phonemes (the ü in German and the ñ in Spanish), (b) understanding the need to recognize false cognates (like German "Hell" and Spanish "embarazada"), (c) appreciating idiomatic phrases and the arbitrary nature of syntax (e.g., whether adjectives go before or after the noun, the gender assigned to nouns), (d) acquiring proficiency in the schema for basic social interactions (e.g., exchanging names, asking for directions, ordering at a restaurant), and (e) recognizing that each language has its own distinctive pros and cons in expressing specific ideas and feelings (e.g., different uses of the subjunctive mood). These instructional commonalities are so universal that whole books have been written on how to learn a foreign language, any language. By the same token, I believe that an instructor can teach for creativity in a generic sense, using principles applicable to any domain.

One reason why I believe this is that I've devoted my entire career to studying the highest possible manifestations of creativity (Simonton, 2010). Something that impressed me very early (and that continues to impress me) is the exceptional versatility of creative geniuses (Cassandro, 1998; Cassandro & Simonton, 2010; Simonton, 1976; Sulloway, 1996; White, 1931). Rather than become monomaniacs focused on a single domain that they master with an inordinate degree of "overlearning," such geniuses tend to exhibit broad interests and a range of skills, even in domains far apart. For instance, eminence as a scientist is positively associated with having artistic avocations (Root-Bernstein et al., 2008; Root-Bernstein, Bernstein, & Garnier, 1995). Furthermore, this correlation is more than a mere manifestation of openness to experience, a personality trait also linked to creativity (Carson, Peterson, & Higgins, 2005; Harris, 2004; McCrae, 1987), because highly creative people have actually taken the time to acquire sufficient expertise to make contributions outside their chosen domain. Better yet, sometimes hobby or other leisure activity will make a direct contribution to the main line of creative endeavor. For example, Galileo's interests in the arts allowed him to make astronomical discoveries that were overlooked by contemporaries with more narrow interests (Simonton, 2012a). In particular, his knowledge and skill in chiaroscuro permit him to both detect and depict the mountains of the moon.

Admittedly, Baer is not aiming at the same prospective creators that I am. Where he's speaking of little-c creativity (divergent thinking), I'm thinking about Big-C Creativity (eminent achievement). Even so, some teachers may yet have the opportunity to cultivate the latter and not just the former. Who wants to miss the chance to encourage creative genius?

Teaching Creatively for Creativity

Needless to say, I could have ended this chapter at the close of the previous section. But I won't. That's because I want to underline the question as to whether it is possible to integrate both aspirations already expressed, to combine teaching

creatively with teaching for creativity. Although the two goals can no doubt be isolated and pursued independently, it may very well be the case that creative teaching makes students more creative than does mere routine teaching. In addition to teaching *for* creativity, the instructor serves as a model *of* creativity. This possibility is so potentially important that I would encourage empirical studies addressing this question. We need highly creative research on whether creative teaching best teaches students to become more creative. And thinking of those who actually teach courses on creativity, maybe we could also use creative research on whether teaching the subject of creativity more creatively increases student creativity in other subjects. How should I construct and instruct my Genius, Creativity, and Leadership class to produce more creative genius in any art or science?

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