Understanding Creativity[1]

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Abstract
Creative is an important trait in improving all aspects of our lives; yet, because it cannot be easily quantified, it is given too little attention in our schools. Creativity is a form of problem solving that relies on being able to first identify problems then redefine them. Some personal traits or characteristics are more amenable to creativity than others; however, all can improve their ability to think creativity through the use of creative thinking skills and by understanding the process of creativity.

Keywords
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Introduction

Creativity is a trait that has helped to produce the most important innovations in human history and solve some of our most complex and compelling problems. So what is it? Creativity is a type of thinking that enables people to generate ideas, invent new ideas, improve old ideas, and recombine existing ideas in a novel fashion (Gallagher & Gallagher, 1994). Creativity is an encounter of the interestedly conscious human being with his or her world; the process of bringing something new into being (May, 1975). Behaviorally creativity can be defined as the ability to produce work that is novel, high in quality, and appropriate (Feldman, Csikszentmihalyi & Gardner, 1994; Sternberg & Lubart, 1999). Novel here means that the work is original or unique, something nobody has thought of or done before. Appropriate in this context means that the work is of some aesthetic or pragmatic value (Starko, 2005; Swartz & Perkins, 1990). Torrance describes creativity as *"the process of sensing difficulties, problems, gaps in information, missing elements, something askew; making guesses and formulating hypotheses about these deficiencies; evaluating and testing these guess and hypothesis; possibly revising and retesting them; and last, communicating the results"* (1993, p 233). This last definition makes creativity sound a lot like science.

Creativity as Problem Solving

Creativity is essentially a type of problem solving (Gardner, 1993). Problems can be found in all areas including the arts, business, science, the military, and even education. Examples: How can we design a car to run on electricity? can this feeling or idea be expressed through movement, dance, music, or visual art in a way that entertains? What kind of a play will enable our team to score a goal? How can I make this relationship work? How can this concept be explained so that people understand it? How can this skill be taught? How can I keep my class actively engaged? How can I write an article so that readers can easily understand important concepts related to creativity? These are all problems that require creative thinking for their ultimate solution.

When looking at creativity as problem solving you will note that this definition sounds similar to Gardner's (1996) and Sternberg's (2003) description of intelligence. Indeed, the line between intelligence and creativity becomes blurred when both cognitive traits are seen as having equal importance in solving problems and creating products (Sternberg, & Lubart, 1991). A creative person is going to be better able to solve problems because the process of generating ideas provides more alternatives from which to evaluate and ultimately choose.

But if you are not aware of a problem in the first place how are you going to be able to solve it? You are not. Thus, being able to perceive problems is also

an important part of creativity (Csikszentmihalyi, 1994). Creative individuals are able to sense the difference between current and ideal states (what is and what could be). Examples of perceiving problems: Our current way of catching mice is not effective. Those old ways of explaining things (theories) don't account for this new information. There needs to be an article written about creativity that readers without a great deal of background knowledge can read, understand, and connect with their lives and experiences. I need to find a more effective way to study. The carbon based fuel we use to power our cars and heat are homes is expensive and is leading to global warming. My students don't seem to be getting the hang of double digit addition.

Redefining Problems

Another trait that enables highly creative people to solve problems is their ability to look at them in different ways (Lipshitze & Waingortin, 1995; Sternberg & Williams, 2002). This is called redefining the problem (Sternberg & Grigorenka, 2000). Creative problem solvers are able to let go of the old ways of thinking, which in turn enables them to generate a variety of novel solutions. This is the "thinking outside the box" cliché with which you are most likely familiar. By freeing themselves from conventional ways of thinking and by examining problems from a variety of angles, highly creative people open themselves up a variety of new possibilities.

As an example of problem redefinition: Currently there is great debate in the United States about how to stop illegal immigration along the Mexican border. Solutions being put forth include fences, border patrols, and cracking down on employers who hire illegal workers. The problem might be redefined as this: How can we create the economic situations so that illegal immigration is not necessary? Many new teachers are faced with the problem of classroom management. One way that is often used to define the problem is this: How can I control these students? Solutions often include getting tough, offering rewards, looking for gimmicks or programs. Instead, the problem might be redefined as this: How can I create a learning experience that offers structure and choice and encourage students to learn in ways that are natural to them?

Other Traits Associated with Creativity and Highly Creative People

Most would agree that, from a practical point of view, creativity is a good thing. Think of all the gadgets and innovations you enjoy today that are a result of creativity and creative thinkers. It is also good from an emotional or intrapersonal point of view. Humanist psychologists describe creativity as a trait the represents the highest degree of emotional health and something found in all humans (May, 1975; Maslow, 1968; Rogers, 1961). To be creative is to be self-actualized and fully human (Maslow, 1971). So are healthy people more

creative or are creative people healthier?

So what are some of the traits of highly creative successful people? In a thirty year longitudinal study Torrance (1992) found that they have the following characteristics: delight in deep thinking, tolerance of mistakes, love of one's work, clear purpose, feeling comfortable being a minority of one, and comfortable being different. Other personal traits associated with creativity, creative thinking, and creative people include the following:

- Self-confidence, independence, risk-taking, energy and enthusiasm, self-confidence adventurousness, curiosity, playfulness, humor, idealism, reflection, sensitivity to problems, ability to define problems, ability to resist premature closure, visualization, analogical thinking, intuition, concentration, nonconformity, unconventionality, and logical thinking (Davis & Rimm, 1998).
- Tolerance for ambiguity, willingness to surmount obstacles, intrinsic motivation, moderate risk-taking, desire for recognition, and willingness to work for recognition (Lynch & Harris, 2001).
- Boldness, courage, freedom, spontaneity, perspicuity, integration, self-acceptance, ability to embrace paradox, ability to put order to chaos, and playfulness (Maslow, 1968).

Creative Dispositions

Very much related to personal traits, Carl Rogers (1961) describes three inner conditions necessary for creativity. These are not static attributes; rather, they are dispositions that can be developed.

Openness to experience. You are free from psychological defenses. This allows thoughts and memories to come into awareness without distorting them. This means also that you are not inclined to see things in predetermined categories or through the lenses of your cultural conditioning. Very much like the concept of right-mindedness found in the Buddhist Nobel Eightfold Path, you are non-judgmental in your attitudes, able to accept without pre-conceived judgment, and able to try on new ideas with which you may not always agree.

Internal locus of evaluation. You strive primarily to produce what you believe to be good products and performance rather than what others to believe these to be. You are not trying to please somebody else in your creation; rather, you are motivated internally, relying on your own standard of evaluation, attempting to create what is of aesthetic and pragmatic value to you.

Ability to toy with elements and concepts. You have a certain child-like quality that invites you to explore and play with ideas. What you believe to be true is not a limiting factor in your exploration. You allow yourself to imagine a variety of possibilities regardless of their likelihood or basis in reality.

Creative Thinking

Think for a minute about the types of thinking specifically used in the creative process. What qualities of thought produce work that is novel, high in quality, and appropriate? Torrance (1992) identifies four: fluency, flexibility, elaboration, and originality

- **Fluency** is the ability to generate a great many ideas. This type of thinking can be used when looking for possible solutions to problems. This is often known as brainstorming (see Figure 1). The important thing with this type of thinking is not to evaluate ideas initially. Evaluating ideas comes only after a great number have been generated.
- **Flexibility** is the ability to generate a variety of different ideas or to produce a number of different approaches. For example, what are some other ways we might be able to get a telescope into space? What are some other ways in which we could generate power for our cars and homes? What are some other ways I might learn this material and pass the midterm exam?
- **Elaboration** is the ability to examine the original thing and generate ideas that can be used to make the original thing better, more interesting, more detailed, or more complex, or more refined. For example, what could I add to a bike, birthday part, or bathtub to make it better?
- **Originality** is the ability to design or create things that are totally new, unique, or novel; things never before imagined. What are some new types of transportation that we have not yet considered? How else might we prepare preservice teachers to meet the demands of the classroom? How could this theme be expressed in a movie in a way that is unique, novel, and interesting?

The Torrance Test of Creative Thinking (TTCT) (Torrance, 1999), the most commonly used creativity test, is designed to measure these four types of thinking. But can creativity really be measured? The jury is still out on this one. While the ability to predict creative achievement is questioned; the TTCT may predict creative potential (Corpley, 2000).

Table 1. Tips for brainstorming

Students (and adults), do not naturally know how to brainstorm; thus, they must be taught the process. Initially, this process should be modeled in large group with the teacher writing down the ideas generated by the class. Later, students can move into small groups. Idea generation works best in pairs or small groups, as students are able to hear a number of ideas. These initial ideas, in turn, serve to generate more ideas. There are four rules for brainstorming. Put these rules in poster form to assist your initial instruction,

and then use this poster for quick review when needed:

- *All ideas must be accepted.* No criticizing or evaluation is allowed. At this stage, bad ideas are just as important as good ideas.
- *Freewheeling is celebrated.* Creative, bizarre, unusual and silly ideas are welcomed along with smart aleck comments and random associations. All of these can be used to stretch our thinking and get us thinking more broadly.
- *The goal of brainstorming is quantity*. The more ideas we have, the greater our choice is in finding a solution.
- *Hitchhiking is welcome*. Hitchhiking is when you add to an idea that has already been state or combine two or more ideas. This is a technique many creative problem solvers use. Encourage your students to do this as well.

Knowledge, Intelligence, and Creativity

To be creative you must first have a body of knowledge (Feldhusen, 1995; Gallagher & Gallagher, 1994; Gardner, 1994; Piirto, 1994). Creativity involves the manipulation of ideas from a knowledge base. Without a body of knowledge there is nothing to manipulate. Without a box there is not a box of which to step outside. This is one of the reasons why it is important to have well-structured curriculums that lay out a plan for presenting students with a fair amount of knowledge in an organized fashion. Among other things, a body of knowledge enhances students' ability to think creatively and to solve problems (Chi, Feltovich, & Glaser, 1981; de Groot, 1965).

There is also some relationship between creativity and intelligence (Good & Brophy, 1995). Intelligence is used to facilitate the development of a well-organized knowledge base, thus making it easier to retrieve ideas, relate new information into existing schemas, and to manipulate ideas in new and interesting ways (Feldhusen, 1995). However, while some amount of intelligence is required for creative achievement, highly intelligent people are not necessarily highly creative (Starko, 2005). And as pointed out earlier, the line between creativity and intelligence can become blurred as both are instrumental in solving problems.

The Creative Process

The last area examined here is the creative process. Creativity rarely happens by accident. It does not just occur; rather, it is a purposeful act requiring preparation, hard work, and discipline (Marzano et al., 1988). The sudden creative insight that inventors and artists sometimes describe is usually the last step in a long thinking process that occurs over time. Creativity is not a drive through experience. It is not an event, but a process. We can enhance our

creativity by attending to the process. The Wallas Model of Creativity (Wallas, 1926), one of the most common models of creativity, proposes four stages of the creative process:

Step 1. Preparation. This is the stage where the problem is first perceived and defined, information about the problem is gathered, and ideas are generated. As examples, we will look at two college students, Polly and Pat, who both attend Moosebutt University. Polly, an English Creative Writing major is assigned to write a piece of fiction for her creative writing course. During the preparation stage she has a sense of her topic and she starts brainstorming or listing ideas, and get's background information to help her with her story. Pat, a sociology major, is looking for a research project for his senior paper. During this stage he selects his topic and begins to review the literature and takes notes. Both Polly and Pat have a sense of where they are going at this stage, but it is still unclear what the final product is going to look like.

Step 2. Incubation. Here, both the conscious and unconscious mind manipulate the problem and think about possible solutions. New information is related to existing information and existing schemata are reorganized to accommodate new information. Sometimes stages one and two merge into each other slightly. At this stage Polly is creating outlines and initial drafts. Pat also is creating outlines and initial drafts, but for both, the path they'll take is still unclear. Their writing may seem labored at this point. A lot of work at the incubation stage takes place unconsciously. Polly and Pat, who are both good students, know the importance of starting their projects early. This gives them lots of time to process information, to think about their projects with the conscious part of their mind, and to percolate with the unconscious part.

Step 3. Illumination. In this stage, the creator suddenly sees the idea, concept, or solution to the problem. At some point, as Polly and Pat have been preparing, processing, incubating, and percolating, they get a sudden insight about exactly how their story and research project should go. Their projects appear to fall together instantly. At this point, their writing and researching seems almost effortless. However, this "aha" moment would not have occurred had they not prepared, processed, incubated, and percolated.

Step 4. Verification. This is an evaluative stage where the creator verifies or tests the idea, concept, or solution. At this stage, Polly and Pat have finished their initial drafts and are in the process of revising and getting feedback on their projects. During this stage there may also be a series of little illuminations. The "aha" moment occurs in varying degrees and dimensions. And of course, the ultimate verification is the grade of A they received on their projects and the recognition they received from Moosebutt University for their outstanding

creative and scholarly achievements.

Their grade of A also verifies the creative process. A bit of advice for undergraduate students: It ***always*** pays to start your assignments and projects early. Some student claim they work better under the pressure of a deadline at the last minute. While this may strengthen their motivation, it does not result in a better product or performance. By starting early you will find that you will spend less time and end up with a better product than by starting at the last minute.

Concluding Thoughts

Creativity is a trait that has lead to humanity's greatest innovations, yet is given too little attention in our schools. Perhaps this is because it is not as easily quantified as some traits. Creativity is a form of problem solving and a process that occurs over time. Understanding creativity will help teachers nurture it in themselves and their students. Creative teachers will help bring about the innovations necessary to improve educations and their own classrooms. And ultimately, our creative students will bring about the changes necessary to improve the human condition and the world in which we live.

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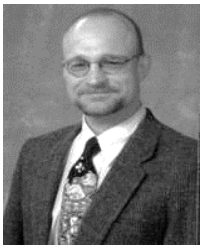

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References

Checkley, K. (1997). The first seven and the eighth: A conversation with Howard Gardner. *Educational Leadership, 55*, 8-13.

Chi, M.T., Feltovish, P.J., & Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. Cognitive Science, 5, 121-152.

Corpley, A. (2000). Defining and measuring creativity: Are creativity tests worth using? *Roeper Review, 23*, 72-79.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience.* New York: HarperPerennial.

Csikszentmihalyi, M. (1994). The domain of creativity. In D. Feldman, M. Csikzentmihalyi, & H. Gardner (Eds.). *Changing the world: A framework for the study of creativity*. Westport, CT: Praeger Publishing.

DeGroot, A.D. (1965). *Thought and choice in chess*. The Hague: Mouton.

Davis, G.A., & Rimm, S.B. (1998) *Education of the gifted and talented* (4th ed.). Needham Heights, MA: Allyn and Bacon.

Feldman, D.H., Csikzentmihalyi, M., & Gardner, H. (1994). *Changing the world: A framework for the study of creativity*. Westport, CT: Praeger Publishing.

Feldhusen, J.F. (1995). Creativity: Knowledge base, metacognitive skills, and personality factors. *Journal of Creative Behavior, 29,* 255-268.

Gallagher, J.J., & Gallagher, S.A. (1994). *Teaching the gifted child* (4th ed.). Needham Heights, MA: Allyn and Bacon.

Gardner, H. (1983). *Frames of mind.* New York: HarperCollins

Gardner, H. (1994). *Creating minds.* New York: Basic Books

Gardner, H. (1996). Reflection on multiple intelligence: Myths and messages. *Phi Delta Kappan, 77,* 200-209.

Gardner, H (1999) *Intelligence Reframed: Multiple Intelligences for the 21st Century*. New York. Basic Books.

Lipshitz, A., & Waingortin, M. (1995). Getting out of ruts: A laboratory study of a cognitive model of reframing. *Journal of Creative Behavior, 29*, 151-172.

Lynch, M.D. & Harris, C.D. (2001). *Fostering creativity in children, K-8*. Boston, MA: Allyn and Bacon.

Marzano, R.J., Brandt, R.S., Hughes, C.S., Jones, B.F., Presseisen, B.R., Rankin, S.C., & Suhor, C. (1988). *Dimensions of thinking.* Alexandria, VA: The Association for Supervision and Curriculum Development.

Maslow, A. (1971). *The farther reaches of human nature.* New York: Viking Press.

Maslow, A. (1968). Toward a psychology of being (3rd ed.). New York. John Wiley and Sons, Inc.

May, R. (1975). *The courage to create.* New York. Norton.

Piirto, J. (1994). *Talented children and adults: Their development and education*. New York: Macmillan.

Rogers, C. (1961). *On becoming a person.* Boston, MA. Houghton Mifflin company.

Starko, A. J. (2005). *Creativity in the classroom: Schools of curious delight* (3rd. ed). Mahwah, NJ: Lawrence Erlbaum.

Sternberg, R. (1996). *Successful intelligence: How practical and creative intelligence determine success in life*. New York: Plume.

Sternberg, R. J. (2003). A broad view of intelligence: A theory of successful intelligence. *Consulting Psychology Journal: Practice and Research*, 55, 139-154.

Sternberg, R.J. & Grigorenka, E. (2000). *Teaching for successful intelligence.* Arlington Heights, IL: Skylight Professional Development.

Sternberg, R. & Grigorenka, E. (2006). Cultural intelligence and successful intelligence. *Group Organization & Management, 31,* 27-39.

Sternberg, R.J., & Lubart, T. (1991). Creative giftedness: A multivariate

investment approach. *Gifted Child Quarterly, 37*, 7-15.
Sternberg, R.J. & Lubart, T.I. (1999). The concept of creativity: Prospects and paradigms. In R.J. Sternberg (Ed.), *Handbook of creativity* (pp. 3-15). New York: Cambridge University Press.
Sternberg, R.J. Williams, W.M. (2002). *Educational psychology*. Boston, MA: A Pearson Education.
Swartz, R.J., & Perkins, D.N. (1990). *Teaching thinking: Issues and approaches*. Pacific Grove, CA: Midwest Publication.
Torrance, E.P. (1992). The beyonders in a thirty year longitudinal study of creative achievement. *Roeper Review, 15* 131-139.
Torrance, E. P. (1993). Understanding creativity: Where to start? *Psychological Inquiry, 4*, 232-234.
Torrance, E.P. (1999). *Torrance Test of Creative Thinking: Norms and technical manual*. Beaconville, IL. Scholastic Testing Services.
Wallas, G. (1926). *The art of thought*. New York: Harcourt, Brace, & World.