Stepmother: She'd just bring it home, you fool! I've got it! Let's stop her from going to the Prince's ball!

Esmerelda: Oh mother, that's a super idea! Isn't it wonderful how a warm, receptive, and encouraging atmosphere can stimulate creative thinking!

Many countries are increasing the priority schools assign to creative thinking . . . to enhance productivity and improve mental health. . . . But efforts to replace customary education practices often meet resistance.

Robert D. Strom and Paris S. Strom

EDUCATING FOR CREATIVE THINKING AND PROBLEM SOLVING

Increased Creativity Consciousness

There is growing awareness of the importance of educating students for creative thinking and problem solving. All aspects of our culture—aesthetic, scientific, technological, and educational—can and have already benefited from creative ideas produced by energetic, imaginative people. Earlier we noted the continuing strong need for creative imagination in the business world. Chapters 8 and 9 presented a sample of techniques—virtually all born in the corporate setting—that reflects ef-

Especially in Corporate Settings

forts to improve creative problem solving at all corporate levels. For example, some perennial corporate problems are streamlining management and organization, lowering costs, raising efficiency, improving product quality, developing products that beat the competition, taking advantage of new materials and processes, attracting and retaining quality personnel, and improving marketing and advertising. Most of these problems include predicting the future, an intrinsically creative activity.

Worldwide

The education-for-creativity movement is worldwide. Strom and Strom (2002) noted that the Japan National Commission on Education Reform decided that its universities are not teaching the creative thinking and problem solving needed for Japan. Similarly, the Education Ministry for the Republic of China wants Chinese universities to teach more creativity and less rote learning. Senge and colleagues (2000) reviewed similar business-inspired recommendations for America and Europe.

Strom and Strom (2002) concluded that "Helping students perform well in the realm of creative behavior requires change in the rules that guide education policy and teaching practice" (p. 183). Most critically, they recommended that teacher education assign a high priority to teaching for creative thinking.

Less Recall, More Creativity

They noted that, following tradition, teachers are trained to efficiently communicate the subject matter. A better direction is less emphasis on student recall of information, and more on discovery of information that solves a problem. For example, using the library and the Internet students can learn to locate, organize, and synthesize information into coherent problem solutions. Creative problem solving is required throughout.

Work Groups Can Inhibit Creativity

John-Steiner (2000) reported that working in groups can inhibit the creativity of individual students. John-Steiner emphasized that—with coaching—students can learn to:

- Avoid impetuous decisions
- Hitchhike on others' ideas
- Consider ideas they initially dislike
- Think logically in order to challenge peers
- Look for other ways to view a problem

Strom and Strom (2002) recommended Future Problem Solving (described in Chapter 11) for promoting all of these aspects of cooperative creative thinking.

As other creativity-promoting recommendations, Strom and Strom (2002) suggested that teachers:

Strom and Strom Recommendations

- Solicit student views of school procedures
- Encourage constructive use of free time, for example, when finishing their work early
- Permit alone time
- Award class credit for questions and curiosity
- Help students become more concerned about the needs of others
- Give students opportunities to use their lively imaginations
- Allow students to help select learning goals and procedures
- Reduce criticism and too-frequent evaluation

This Chapter

1. Issues

2. Earlier Chapters

3. Infants, Young Children

4. Five Core Goals

This chapter includes four main parts. We first will look at some issues and considerations that relate to strengthening skills, abilities, and predispositions for creative thinking—beginning with the core questions "Can creativity be taught?". The matter is not simple nor does it elicit quick agreement. Second, we will review concepts, ideas, and assumptions related to teaching for creative growth that appeared in every previous chapter. Third, we will take a broad-based approach to cultivating creative potential by forwarding some uncomplicated developmental suggestions for increasing intellectual growth and problem-solving skills of infants and young children. Finally, we will describe five core goals of creativity training plus strategies for achieving them.

ISSUES IN CREATIVITY TRAINING

Issues

This section will look at these issues:

- Can creativity be taught?
- Individual differences in responsiveness to creativity training
- Individual differences in motivation to create
- The importance of a creative climate
- Must creativity be taught within a content area?

Can Creativity Be Taught?

The most frequent question your author is asked is, "Can creativity be taught? Or are you born with it?" Sometimes the issue is raised in a negative form— "I don't think you can teach creativity," followed by the inevitable rationale, "You either have it or you don't!"

Individual Differences

Of course, there are tremendous individual differences in innate creative abilities and in affective dispositions toward creativity, just as there are wide variations in every other mental and physical characteristic. Realistically, no amount of the most carefully orchestrated creativity training can mold an average person into a Leonardo DaVinci, Marie Curie, Thomas Edison, William Shakespeare,

Walt Disney, Booker T. Washington, or Orson Welles. Such people are born with a special combination of high intelligence, creative ability, extraordinary drive, and a strong sense of vision and destiny. Their drive leads them to acquire a great depth of knowledge and experience in their chosen fields.

Learning: Yes

However, it also is absolutely true that every individual can raise his or her creative skill, creative productivity, and creative living to a higher level. An irrefutable argument for the trainability of creativity is simply that, with interest and effort, all of us can make better use of the creative abilities we were born with.

Creativity Can Be Taught: Torrance

What does creativity guru Paul Torrance (1995) say about whether creativity can be taught?

> I know that it is possible to teach children to think creatively and that it can be done in a variety of ways. I have done it. I have seen my wife do it; I have seen other excellent teachers do it. I have seen children who had seemed previously to be "non thinkers" learn to think creatively, and I have seen them continuing for years thereafter to think creatively. I have seen, heard, and otherwise experienced their creativity. Their parents have told me that they saw it happening. Many of the children, now adults, say that it happened. I also know that these things would not have happened by chance because I have seen them not happen to multitudes of their peers. (p. 269)

Massive Evidence

Torrance (1995) itemized 142 studies describing efforts to "teach creativity" with divergent thinking exercises, training in the Creative Problem Solving (CPS) model, training in creative art or writing, establishing a creative climate, or using various creativity training workbooks or programs. Success rates (Torrance Test scores, creative products, creative self-perceptions) were good. "Massive evidence" was the phrase Torrance (1987b) used to describe the overall results of these efforts to teach creative thinking. CPS, FPS, and OM especially were recommended.

Individual Differences in Responsiveness to Creativity Training

Differences in Receptiveness to Training

Just as there are immense individual differences in cognitive abilities and affective predispositions for creativity, there also are individual differences in *receptiveness* to creativity training. That is, receptiveness to adopting the required creativity consciousness and other attitudinal predispositions toward thinking creatively and doing things creatively. Some children and adults respond quickly and positively to such training. They learn that, yes indeed, they can imagine, visualize, create, and solve problems better than they expected—the capability was there all along, they just never tried to use it. Others seem impervious to creativity training, due to some combinations of disinterest, rigidity, insecurity, conformity, or other traits and barriers that are incompatible with creative thinking and behavior.

No Sir! You Can't Make Me More Creative!

College Course: Improved Affective Components

Your author taught undergraduate and graduate courses in creative thinking that had two purposes. First was the academic goal of transmitting a body of knowledge about issues, theories, characteristics, processes, tests, and techniques of creativity, along with strategies for teaching for creative growth. The second purpose was to help students become more creatively productive by raising their creativity consciousness, explaining how others use creativity techniques, and motivating them to use their creative abilities. One of our studies showed that, *on average*, students who completed the course improved in their affective creative traits—creative attitudes, predispositions, and self-ratings of creativity—significantly more than students who had registered for but had not yet taken the course (Davis & Bull, 1978).

Creative thinking and your creative development are important in any career. "I'm sure glad my dental school taught me to use my imagination!" said Dr. Goldcap. "Do I get a lollypop?" asked his nervous patient. (From *Why Worry?*, Starring Harold Lloyd. Copyright © 1923 by Harold Lloyd Trust. Reprinted by permission.)

Memorize the Stuff, Take the Tests

Some Are Influenced Profoundly

Be Ready for Differences in Responsiveness

However, there always were substantial differences in the degree to which students' creative potential was affected by the exposure. Some students registered for the course, met the requirements, but remained untouched by the potentially life-changing principles and concepts. Other students experienced changes in their self-perceptions of creativeness and their actual creative output; they discovered capabilities they did not know they had. As a few examples, one person wrote her first and potentially publishable children's book as a direct result of the class; another invented an educational game that was sold to Fisher Price Toys; and another began writing poetry, and lots of it, for the very first time. Two memorable testimonials were "Now I understand my own creativity better" and "Now I do weird things."

There are wide differences then, in responsiveness to creativity training. Teachers of creativity should be prepared for these differences, and perhaps ready to work a little harder with low-receptivity students.

Individual Differences in Motivation to Create

Motivation Differences

There also are large differences in motivation for creativity. As we noted in Chapters 3 and 5, a high energy level is a common characteristic of creative people. Related traits are high levels of curiosity, adventurousness, spontaneity, and risk-taking, plus wide and perhaps novel interests and hobbies. For creative eminence, Torrance's (1987a) "blazing drive" seems to energize the creative productivity.

RAS Theory

Motivation theorists Berlyne (1961) and Farley (1986) assume that the high level of "arousal-seeking" common among creative people is governed by the reticular activating system (RAS) in the brain stem. According to this theory, creative and adventurous activities are sought out in order to raise an uncomfortably low level of RAS activity to a higher, more optimal state.

Raise Interest, Involve Students

There is not much we can do about students' reticular activating systems. However, the RAS hypothesis does not prevent a teacher from working to elevate students' interest in creative thinking, while concurrently exercising creative skills and abilities and engaging students in artistic, scientific, and other entrepreneurial work.

Creative Atmosphere

Psychological Safety

We do not need a long discussion of the critical importance of a receptive and reinforcing creative atmosphere. Carl Rogers (1962) called it *psychological safety*; in

Deferred Judgment

brainstorming it is *deferred judgment*. We saw in Chapter 2 that if creative ideas are not reinforced—or worse, if they are blocked, criticized, or squelched—normal children and adults simply will not produce creative ideas in those unreceptive circumstances. One of our five main goals of creativity training will be fostering creativity consciousness and creative attitudes. These require a creative atmosphere.

Must Creativity Be Taught within a Content Area?

We decided in Chapter 1 that creativity need not be taught within a subject area. Effective creativity training may be content free or it may be embedded within a

SA and ST Creativity

content area. Maslow's (1954) *self-actualized creativity* includes the mentally healthy tendency to approach all aspects of one's life—personal, professional, avocational—in a creative fashion. It is a general, content free form of creativeness. As we noted earlier, many successful creativity courses, programs, workshops, and educational workbooks try to teach a general creativeness by strengthening creativity con-

Can Teach General, Content-Free Creativity

sciousness and other creative attitudes, as well as by exercising creative abilities and teaching creativity techniques, perhaps including the CPS model. These efforts help the learner to understand creativity and to approach personal, academic, and professional problems in a more creative fashion. The approach is sensible, common, and effective. It is not tied to a particular subject or content.

FPS, OM

For elementary and secondary students, the Future Problem Solving and Odyssey of the Mind programs (Chapter 11) are two excellent examples of successful efforts to teach a general, self-actualized type of creativeness. A highly rec-

CPSI

ommended program for adults is the one-week Creative Problem Solving Institute held in Buffalo, New York, each June. Most participants return home as different, more creative, and more self-actualized persons.[1]

Special Talent Creativity

On the other hand, Maslow's *special talent creativity* refers to an obviously outstanding creative talent or gift in art, literature, music, theater, science, business, or other area. Special talent creativity presumes some mastery of that area, and the

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[1]For information: Creative Education Foundation, 1050 Union Road, Buffalo, NY 14224, or www.cef-cpsi.org/.

greater the sophistication the more likely are creative contributions. Snow (1986), for example, wrote that "Creativity ... is an accomplishment born of intensive study, long reflection, persistence, and interest ... A rich store of knowledge in a field is required as a base for idea production" (p. 1033).

Goals: Strengthening Creative Thinking Skills, Mastering Content Skills

Independent Projects

As for teaching special talent creativity, the two goals are strengthening creative thinking and problem solving attitudes and skills while concurrently guiding students in mastering content and technical skills in the particular area. With the typical independent projects approach, students are given (or find) a high-interest project or problem. They proceed to clarify it, consider various approaches, find a main solution or resolution, and then create or prepare the project or problem for presentation. Throughout, students identify and resolve numerous subproblems; they evaluate their methods and results; they acquire content knowledge and develop technical skills; and they develop content-related creative

A Common G/T Strategy

problem solving skills and abilities. The independent projects strategy nicely fits Maslow's category of special talent creativity.

SA and ST Creativity Overlap

As the reader might guess, special talent creativity may be strengthened while teaching a general, self-actualized type of creativeness, and vice versa. For example, within a primarily content-free creativity session students might brainstorm a science-, history- or math-related problem or they might do creative writing, creative dramatics, or art activities. Conversely, creative projects in a subject area (special talent creativity) are very likely to help develop general creative abilities and attitudes (self-actualized creativity) that extend beyond the specific topic at hand.

However, the (frequent) argument that "you can't teach creativity in the abstract because you have to have something to be creative with" sounds logical but makes little sense. Every creativity course, program, and technique, in addition to this book tries to teach a general creativeness, which can be applied in many specific situations.

THIS BOOK SO FAR

In our first 12 chapters we have seen many concepts and principles related to becoming a more imaginative, flexible, creative thinker.

Chapter 1

Creativity Consciousness

Self-Actualization

Chapter 1 sought mainly to increase your creativity consciousness by stressing the importance of creativity, both to yourself as a self-actualizing person and to society. Nothing can be more important to life satisfaction (yours) than becoming self-actualized: becoming what you are capable of becoming, being an independent, forward-growing, fully-functioning, democratic-minded, and mentally healthy individual.

Chapter 2

Blocks and Barriers

A Few Whacks and Squelchers

Chapter 2 looked at blocks and barriers that prevent us from thinking and behaving more creatively. We reviewed the effects of habit and learning, rules and traditions, perceptual blocks, cultural blocks (especially conformity and the cultural mores themselves), emotional blocks, and even resource barriers. We noted that creativity expert von Oech recommended a "whack on the side of the head" to jolt us out of our mental blocks—habits and attitudes relating to finding one right answer; being logical, practical, and correct; avoiding ambiguity, play, and foolishness; and assuming "I'm not creative!" The chapter ended with a list of statements that squelch creative thinking—the idea squelchers.