

The Power of Creativity

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Ideas for Teachers

Psychologist Dr. E. Paul Torrance once stated that it takes 75 years for an idea to be fully accepted by society. He was referring to his pioneering research in creativity at the University of Minnesota in the late 1950s. Torrance became the director of the Bureau of Educational Research at the University of Minnesota in 1958, shortly after the Soviet Union launched its Sputnik satellites. The Cold War was raging and suddenly the West could no longer count on scientific superiority. In response, the United States mobilized education professionals to identify and develop a new generation of scientifically talented youth.

This article examines Torrance's concept of creativity and explains why the skills of creativity should be part of every child's education, at home and in school. We discuss the differences between intelligence and creativity, how to recognize and measure creative skills, and how to encourage and teach for creative thinking. We end with a call to action for teachers to introduce the teaching of creativity in schools.

The Torrance Creativity Tests

"Whenever one is faced with a problem for which he has no practiced or learned solution, some degree of creativity is required," Torrance often said. Being creative involves self-discovery, self-discipline and imagination. In his formal definition, Torrance outlined the creative process as

- sensing difficulties, problems, missing elements, something askew;
- making guesses and formulating hypotheses about deficiencies;
- evaluating and testing these guesses and hypotheses;

- revising and retesting (if required); and
- communicating the results.

Strikingly, these processes mirror precisely what scientists and engineers do. Torrance concluded that identifying and developing creative people would clearly be critical to America's Cold War education mission.

With this in mind, Torrance and his graduate students devised a battery of tests—the Torrance Tests of Creative Thinking (TTCT)—to measure the skills of creative production and behaviour. The TTCT differ markedly from typical intelligence (IQ) and proficiency tests, where memory and perceptual skills (convergent thoughts) point to single correct answers. Torrance's tests measure divergent thinking—the ability to find multiple solutions to a problem. In addition to quantifying the skills involved in producing and refining ideas—fluency, flexibility, originality and elaboration—the tests take into account creative strengths (see illustration) that enrich creative production.

The Torrance creativity tests are divided into verbal and figural components (for a more detailed description of the TTCT, see the appendix to this article).

The TTCT is the most researched creativity test in the world. It is translated into more than 50 languages and has been used in more than 2,000 studies. Students who took the TTCT between 1958 and 1962 have been followed over the past 50 years in a longitudinal study. Significantly, those who scored highest when they first took the test show the most creative achievements as adults. Researchers call this phenomenon “predictive validity”—proof that the TTCT measures what it says it does.

The convergent thinking measured by intelligence and proficiency tests and the divergent thinking measured by the TTCT are distinct and complementary. Intelligence tests easily identify people who conform to accepted standards of knowledge, but they may miss a person with speculative, innovative or inventive answers. In today's world, we need knowledgeable people who can also “think outside the box”—who can revise what is known, explore the unknown and construct new meanings.

Creativity for All

Most people say, “Me, creative? No way! I've never produced a great piece of art, composed music, written a novel or invented anything worth mentioning.” The notion that creativity is only for a gifted few is a myth that must be dispelled. Creativity is not just for geniuses. Creativity is for everyone and it is critical to solving problems.

Psychologists talk about “small c” creativity and “big C” creativity. Many people are adaptively creative (small c) in their daily activities at home, school and work and in personal interactions; some people make innovative creative contributions (big C) that are world influencing. The skills of creativity can be developed and nurtured. The first step is to jumpstart your brain. Here are a few exercises for you to try:

Ideational Fluency —Exercise Your Brain

- How many yellow (or green) vegetables can you name in 30 seconds?
- Count backward from 100 by 6s without making a mistake.
- Visualize a golf game (or tennis or other game) you've just played. Can you remember each shot and the course hazards you needed to consider?

Keep an Open Mind

Listen to different kinds of music, even those you don't like. Creative people embrace diversity. Different kinds of music stimulate different parts of the brain. You may even come to appreciate the musical groups that your children (or parents) enjoy.

Keep a Record of Questions

As you incubate ideas and problems, questions arise. They will come to you at different times and situations—while taking a walk, driving in a car, having coffee with friends and so on. Record the questions in a notebook.

Teaching the Skills of Creativity

Writers such as Daniel Goleman, author of *Emotional Intelligence—Why It Can Matter More Than IQ*, have examined an array of academic studies that attempt to measure how much IQ accounts for career success. What do you think these studies found? Surprisingly, IQ accounts for only 4–10 per cent of career success. We propose that a person's CQ—creativity quotient—has a potentially greater influence. Although it is important to teach and assess basic literacy (for example, reading, writing and mathematics), it is equally important to teach skills needed to confront problems that have more than one solution. The convergent thinking of traditional education preserves knowledge, but divergent thinking allows us to extend that knowledge into the unknown. Isn't it time to teach all the skills we need?

Questioning is Important

Finding answers creatively always involves asking good questions. We are all naturally inquisitive, but a person's inquisitiveness can be encouraged or squelched. Children who are "seen but not heard" or who are inert recipients of lectured material at school or in front of a television are cheated out of their full potential. Parents, caregivers and teachers need to encourage, model and value divergent thinking and provide opportunities for children to practise it. "I have six friends who taught me all I know," said Rudyard Kipling: "Who, What, Where, When, Why and How." These questions can open the door to effective, meaningful learning. In addition to Kipling's questions, we suggest a few more that call for creative skills:

- What's wrong or missing? What should change? What don't I know?
- How might things turn out? What might influence the outcome?
- Where else would this work? When?
- Is this the only answer? What are the alternatives?
- Where do my answers lead me? What new questions do they raise?

One elementary school teacher we know has learned much about the nature of questioning by having her students maintain an I Wonder book, in which, in their best handwriting, students write two questions every day. After a year, the children have accumulated an array of inquiry, some of it stunning in quality and originality. Imagine students keeping I Wonder books for their entire school life. What an interesting intellectual autobiography that would make. Other strategies to develop student questioning skills are found in the resources listed at the end of this article.

Periodic evaluation of student progress (report cards) should reflect not only what a child has learned but how he or she has learned it. And mastery of questioning skills can be an important indicator of success. Here are some ideas for how to rate a student's growth as an effective questioner:

- (Name) manages information by asking meaningful questions: 1 2 3 4 5
- (Name) problem finds or formulates questions before seeking solutions: 1 2 3 4 5
- (Name) asks questions to broaden and/or deepen areas of interest: 1 2 3 4 5

Incorporating Creativity Skills

Excellent programs incorporating creativity skills in the classroom do exist. Featured here are two examples.

Tackling critical issues through Future Problem Solving

In 1974, Torrance initiated Future Problem Solving (FPS) as a way of helping students think more creatively and productively about critical issues. The annual program involves 250,000 students from Australia, Canada, Hong Kong, Japan, Korea, Malaysia, New Zealand, Russia, Singapore and the United States. Teams of four students (Grades 4–6, 7–9 and 10–12) use a six-step problem-solving process to address complex real-world problems. They complete two practice problems at school with their coaches in preparation for competitions at the local, regional or international level. Students in Grades K–3 can participate without competing. Topics for 2009/10 included sensory overload, invasive species, orphaned children and food distribution. Student solutions are evaluated by FPS.

FPS also sponsors a Community Problem Solving Division, where students apply the problem-solving process they have learned to issues in their own communities. Winners can participate in the International FPS Conference. A wide range of problems and solutions have been explored, from cleaning up hazardous waste in Utah to sending 2,000 children's books from New York to a library in Fiji.

FPS's Scenario Writing Contest challenges students to write short stories that look at least 20 years into the future. As in other competitive events, students compete in grade levels.

Participants in the FPS program often consider it a highlight of their school experience. Said one student, "[FPS] has given me an opportunity to voice opinions creatively and constructively and

[is] a thoughtful, productive outlet for the frustrations I sometimes feel as a young person drowning in the policies of a distant government or out-of-reach adults.”

For more information about Future Problem Solving, contact FPS International, Inc. Address: 2015 Grant Place, Melbourne, FL 32901; telephone: 800-256-1499; fax: 321-768-0097; website: www.fpspi.org.

Creative skills put to the test in Torrance Legacy Creative Writing Awards

Teachers can involve students in a creative writing experience where student work is evaluated in terms of creative skills. The Torrance Legacy Creative Writing Awards accept original poetry and stories from students in Grades 4–5, 6–8 and 9–12. Prizes are offered (monetary and books), and winning entries are published, bound and presented to the young poets and authors at a national convention. More information on this creative writing program is posted at www.ststesting.com/cw.html.

Making the Case for Creativity

Change challenges all of us to be creative. And fundamental change challenges us fundamentally. As the world transitions from a resource-based to a knowledge-based economy, we need to instill the skills of creativity in our future citizens and leaders. Dr. Indira Samarasekera, president of the University of Alberta, said as much when she addressed the Inspiring Education conference in Alberta (read an excerpt from Samarasekera’s address in this issue of the *ATA Magazine*). A metallurgical engineer by training, Samarasekera pointed to the emergence of the economies of China and India—and their hundreds of millions of people under the age of 25—as a profound challenge to Canada and America in the next 20 years. Creativity, she emphasized, will be essential to every successful country in the 21st century, and good education will be key to maximizing success. Teachers must value creativity and model it to their students, be open to “weirdness, eccentricity and differentness,” make experiential learning as important as formal classroom instruction and learn new skills themselves. She ended her presentation by saying that we need to invent better ways to “opt students in” to the learning/discovery and meaning-making process and measure the skills of creativity along the way.

Key Messages for Creative Living

In his long-term longitudinal study of students who were given the TTCT between 1958 and 1962, Torrance noticed that certain factors support or hinder creative achievement. For example, he found that having a mentor or teacher exerts a positive influence, as does falling in love with a life’s work early. Well-rounded people, it turns out, are not necessarily the most creative. Torrance incorporated these and other findings from his 22-year follow-up into the *Manifesto for Children* (see illustration).

learn the skills of **INDEPENDENCE** and gladly share your infinite creativity.

DO WHAT YOU LOVE & CAN **DO** WELL

Learn to free yourself from the expectations of others and to walk away from the games they **MOUSE** on you. Free yourself to play your own game.

KNOW understand. **TAKE PRIDE IN** practice, practice, practice. **DEVELOP** exploit. *Curry* your greatest strengths.

Don't be afraid to fall in *Love* with something and pursue it with **intensity.**

Find a **great teacher** or mentor who will help you.

MANIFESTO for children

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Don't waste energy trying to be well-rounded.

BY E. PAUL TORRANCE

Torrance developed the concept of “beyonders” after analyzing his longitudinal study data at 30 years. Beyonders are people whose creative achievements as adults go beyond expectations. As in the *Manifesto for Children*, Torrance identified traits and characteristics of beyonders and created a poster—*Manifesto for Adults*—to illustrate his findings.

Manifesto for adults

By E. Paul Torrance
& Garnet Millar



Be ready to make the *creative leap beyond* on the way to becoming a *Beyonder*.

Being a *Beyonder* means doing your very best,
going beyond where you have been before, and
going beyond where others have gone.



They are
tolerant of mistakes
by themselves and others.

The *Beyonders*
take *delight* in
deep thinking.



They are
able to
feel
comfortable
as a
minority of one.



They **love**
the **work**
that they do and
do it well.



They do not waste
needless
energy
trying to be



Well Rounded.



They have a
sense of mission
and have the courage to be

Creative.



**Don't be afraid to make the
Creative Leap Beyond!!**



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Teachers' Call to Action

The time has come to teach creativity in our schools. Here's what teachers can do—talk with local school officials about creative programs and activities. Request that the curriculum make creative skills and activities important learner outcomes. Bring your own creativity to the classroom by modelling creative behaviour and expecting your students to do likewise.

How much longer will we wait for creativity to be accepted, embraced and taught in our homes and schools? By taking action now, we'll prepare our students to live in the creative society of the 21st century. They will learn to

- plan systematically,

- analyze critically,
- work collaboratively,
- communicate clearly,
- design repeatedly,
- learn continually, and
- think creatively.

Resources

Himsl, R., and G.W. Millar. 1994. *Measure of Questioning Skills*. Bensenville, Ill.: Scholastic Testing Service.

Millar, G.W. 1994. *Developing Student Questioning Skills: A Handbook of Tips and Strategies for Teachers*. Bensenville, Ill.: Scholastic Testing Service.

———. 2004. *The Making of a Beyonder: Ways to Nurture Your Creative Achievement and Spirit*. Bensenville, Ill.: Scholastic Testing Service.

———. 2010. *The Power of Creativity: Results of the Fifty-Year Follow-Up to the Torrance Longitudinal Study of Creative Behavior*. Bensenville, Ill.: Scholastic Testing Service.

Dr. Garnet Millar is the principal investigator of the Torrance Longitudinal Study of Creative Behavior. He just completed the 50-year follow-up study. Millar is a school psychologist in private practice in Sherwood Park, Alberta. He collaborated with Dr. E. Paul Torrance at the University of Georgia for 25 years.

Christine Dahl is a “Torrance kid” who was assessed as an elementary school student by Dr. E. Paul Torrance while she attended Grades 3–6 (1958 to 1961) at University Elementary School, in Minneapolis, Minnesota. She is a music teacher and pianist.