Torrance Journal for Applied Creativity

Full Bloom by Edward Freeman
Chicago, IL

Volume 1

Communicating creativity as delineated by E. Paul Torrance and others, and advocating for its application to classroom and educational experiences.

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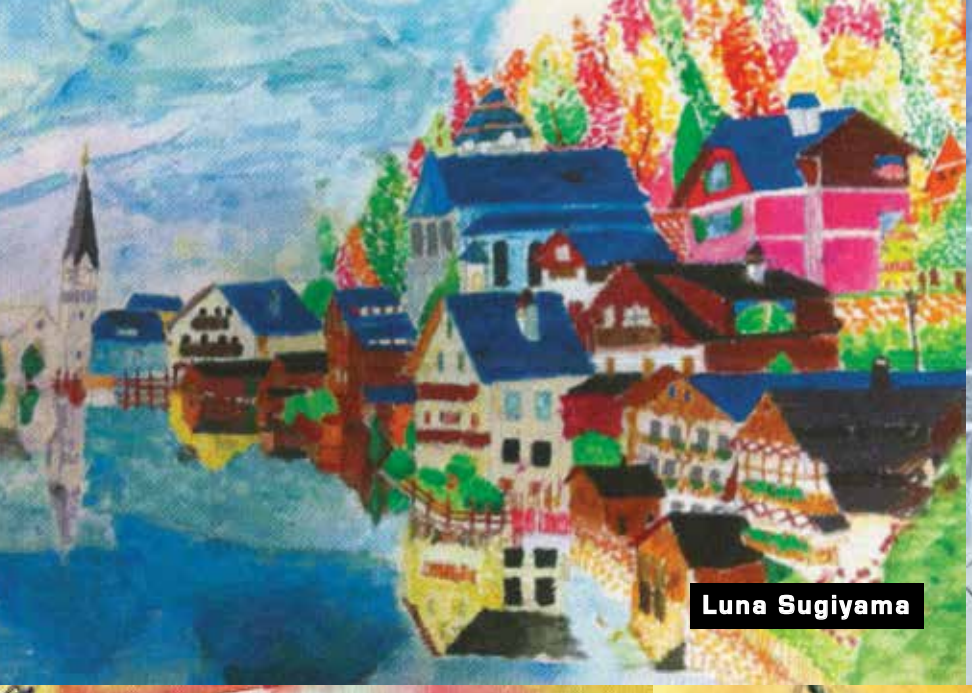
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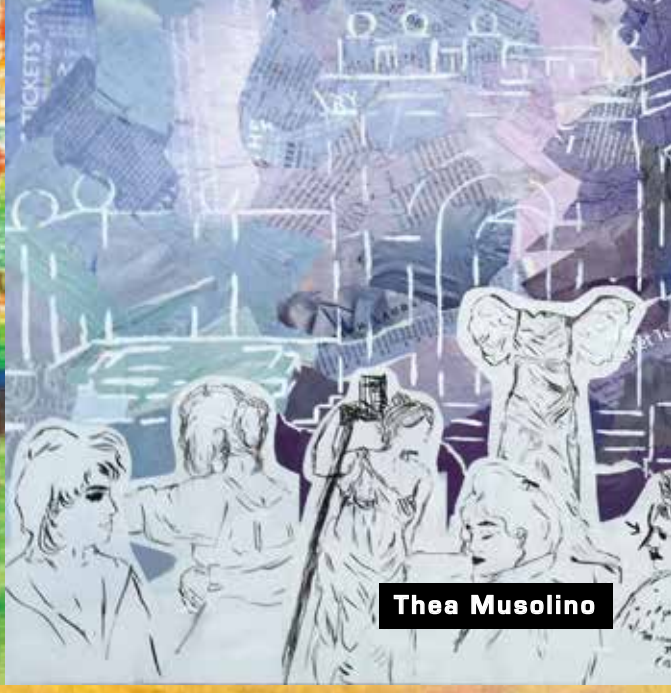
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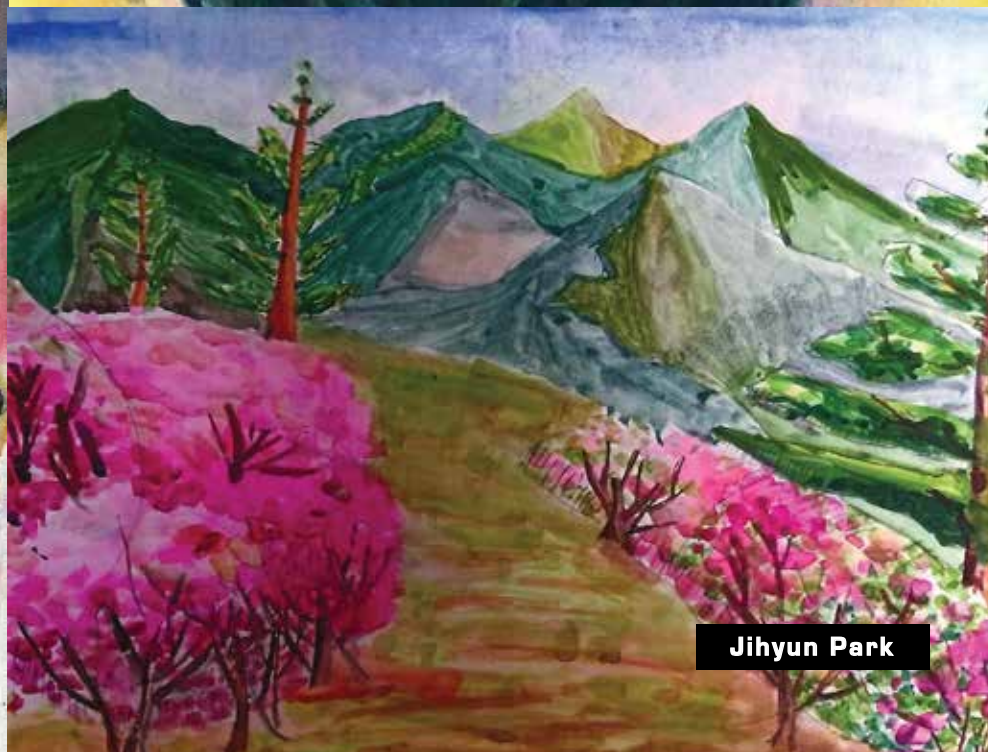
Jihyun Park

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Preface

On behalf of the Journal Advisory Board, the editorial staff, graphic designer, authors, and reviewers in the field, I am delighted to present the inaugural issue of the *Torrance Journal for Applied Creativity.*

Since there is no shortage of creativity periodicals, it is fair to ask, Why another creativity journal? First, we saw a need for stronger links between research and practice and to focus on how creative ideas, models, methods, and programs are working in diverse settings. How effectively are they responding to the felt needs of teachers, counselors, administrators, parents, and students? And to what extent are teachers, leaders, and innovators in the field able to share their creative discoveries with other communities around the globe? The aim of this journal is to open up this conversation beyond the level of higher education to include creativity workers of all kinds—professors/researchers, classroom teachers, artists and arts teachers, designers, engineers, program developers, counselors, and more.

Second, we wished specifically to honor the immense contributions of pioneer author, innovator, and researcher in the field of applied creativity, E. Paul Torrance. With Torrance as our inspiration, we sought to find authors who use, adapt, or extend his ideas, without in any way excluding others who have discovered alternative concepts or methods that have proven effective creative strategies for teaching or counseling children. Torrance was an open-minded and global thinker, and was always eager to explore new ideas for engaging people in the creative process.

This inaugural issue shows how diverse and wide-ranging the interests of the field have become. Divided into five sections, the articles provide a view of the broad tent of applied creativity and the exciting possibilities of cross-fertilization among different communities of learners. The contributors—whether affiliated with universities, institutes, schools, clinics, or classrooms—explore creative ideas, models, and programs as they affect children and young people, and the families around them. The journal aims to emphasize this bridge to actual learning communities and create an exchange of information and insight among creativity workers that is ongoing and dynamic.

The inaugural issue owes much to many people. Thanks are due first to Sarah Sumners, Interim Director of the Torrance Center for Creativity and Talent Development (University of Georgia), who enthusiastically embraced the concept of this journal from the beginning and supported its evolution through every phase of development. We are grateful for the generosity expressed by the committee at the Torrance Center for Creativity and Talent Development who helped us to establish parameters for the journal and provide the necessary funding to support its launch. We cannot neglect to mention the perceptive support of the Torrance Journal Advisory Board, as well as that of the teachers and other practitioners who reviewed the articles and demonstrated the application of the Torrance ideas to classrooms, studios, and workshops. These are the readers who are particularly invested in mentoring and nurturing creativity in children and young people.

Lastly I should like to express immeasurable gratitude for my tireless co-editor, for the editorial staff, and for the superb graphic designer who gave generously of their time and expertise to bring this large project to fruition. Their professionalism, attention to detail, and sense of humor carried them through the challenging moments and made the process a rich and pleasurable one.

From the beginning, we decided that the *Torrance Journal for Applied Creativity* should be published as an open-access online publication, with a limited number of hard copies printed for centers, institutes, schools, and also available to teachers, researchers, scholars, and other creativity workers who want to purchase them. Having an open-access journal would significantly expand readership—not only within the United States, but internationally—and would ensure that people who stand to benefit from its contents and/or have something valuable to share are not excluded. We felt that it would be in keeping with the spirit of E. Paul Torrance to make creative ideas available and open to all who cherish and need them.

Joan Franklin Smutny
Director of the Midwest Torrance Center for Creativity/The Center for Gifted

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E. Paul Torrance, the Scholar, the Teacher, the Man

by Bonnie Cramond

It is a privilege to write a piece for this first journal initiated in Torrance's name to continue a mission very dear to his heart—encouraging teachers to incorporate creativity into their lessons. Through this article, I hope to introduce Torrance to a wider audience and to reintroduce him in a new way to some of those who think they know him. Now, 100 years after his birth, and 12 years after his death, there are fewer and fewer people who knew him. Therefore, I feel that it is important for those of us who did know him to share with others what he was like and the lessons that he taught us. Like all complex people, he cannot be captured in a few pages, but I hope to show a bit of the scholar, the teacher, and the man I knew. I hope teachers who read this may feel inspired by him and encouraged to do what they can to continue to nurture the creativity in their charges.

The Scholar

Although many people know Torrance from his eponymous tests, the tests were one part of his work, and in his view, not the most important part. He developed tests of creative thinking because he had to have a way to measure the success of methods designed to nurture creative thinking, but he always saw them as a means to an end, not an end in themselves. During his very productive career, he published over 1500 articles and books; saw his work disseminated worldwide and translated into over 40 different languages; and collected so many creativity tests, books, and educational resources that the University of Georgia library became the largest repository of creativity materials in the world. Of all of his research and writings, four major accomplishments stand out: The many tests he developed, the longitudinal research connected to the predictive validity of the tests, the Incubation Curriculum Model, and the Future Problem Solving Program.

The Tests

Thinking Creatively with Pictures and Thinking Creatively with Words are the two tests of creative thinking that are usually referred to as the Torrance Tests of Creative Thinking (TTCT, 1966), figural and verbal, respectively. Although Torrance developed many other tests, both published and unpublished, these two are the most widely used and studied creativity tests. The TTCT are published by the Scholastic Testing Company, as are several other tests by Torrance, such as Thinking Creatively in Action and Movement (TCAM) for preschool children; and Sounds and Images and Onomatopoeia and Words, which were published together as Thinking Creatively with Sounds and Words (TCSW). Finally, he worked with Kathy Goff to develop the Abbreviated Torrance Test for Adults (ATTA).

In order to measure the motivation to create, Torrance developed two scales: The Creative Motivation Scale for adults and What Makes Me Run for children. Rounding out the measures of different aspects of creativity are Something About Myself (SAM), a measure of creative achievements, and What Kind of Person Are You?, a measure of creative personality. Although Torrance developed other kinds of tests, specifically tests of brain laterality, and several that were not published, such as the Mother Goose test, he is best known for his creativity measures, especially Thinking Creatively with Pictures and Thinking Creatively with Words, The Torrance Tests of Creative Thinking (TTCT).

Implications for Educators

By developing tests of creative thinking that had good validity and reliability, Torrance gave educators additional tools for assessing and nurturing students' talents, especially students whose talents might otherwise remain hidden. One such group of children are those who are seen as behavior problems. According to Torrance's observations, creative children are often seen as "wild colts," so discovering and nurturing creativity in such children may redirect their misspent energies toward more positive activities (Torrance, 1990, p. 2).

Published by Scholastic Testing Service:

- Thinking Creatively with Pictures
- Thinking Creatively with Words
- Thinking Creatively in Action and Movement
- Thinking Creatively with Sounds and Words
- Abbreviated Torrance Test for Adults

Other Creativity Tests and Measures:

- The Creative Motivation Scale & What Makes Me Run
- Something About Myself
- What Kind of Person Are You?

The TTCT also gave educators a way to identify gifts and talents in children from underserved populations because they are not as culturally loaded as other standardized assessments that might be used (Torrance, 1971, 1977). The figural form, which requires very little language, is especially helpful for assessing students with limited or no proficiency in English. Whether for identification, curriculum development, or both, the TTCT can provide some information about students that other assessments do not readily measure. Because the items are open-ended, students are also able to express their interests, fears, hopes, knowledge about diverse topics, and emotional states. The TTCT provide teachers with additional information about how their students think through an activity that most children enjoy.

The Longitudinal Research

In order to determine whether the tests he developed had predictive validity for the construct of creativity, Torrance conducted longitudinal studies correlating the scores on the tests with real life creative achievements years later. However, the bigger question, to him, was to find out what happened to students' creativity as they grew up.

The first such study was conducted with high school students seven years after they had been tested. Torrance knew it was much too soon to conduct a follow-up, but he was leaving the University of Minnesota to take on the role as a department head at the University of Georgia. He was afraid that once he left Minnesota, it would be hard for him to follow-up on many of the students, so he conducted his first follow-up before he moved. He then conducted another follow-up with the high school students five years later (Torrance, 1969a, 1972a, 1972b).

The major work came from following up with the students from two elementary schools 22 years (Torrance, 1980; 1981a; 1981b), 30 years (Torrance, 1993), 40 years (Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005), and 50 years (Runco, Millar, Acar, & Cramond, 2010) after they were initially tested in third grade in 1958. These studies established the predictive validity of the Torrance Test by correlating the students' test scores with the quality and quantity of their creative achievements years later. More importantly to Torrance, they gave him some insights into what happens to one's creativity over the years, how some individuals hold on to it, others surrender it, and still others gain it back after surrendering it (Torrance, 1980; 1993).

Some of the factors that hindered some students' creativity were gender, race, and socio-economic factors. Given that the students grew up in the 1950s and 1960s, the first two should not be surprising. Although we could argue that females and minorities still have a struggle to achieve according to their abilities, there were far fewer opportunities before the Civil Rights Movement and the Women's Movement. Poverty, of course, continues to thwart children's development. Torrance found that females and children from the housing projects were more likely to have shown early promise that was later unrealized. One young woman, given the pseudonym Tammy by Torrance, fit in both of those categories and was highlighted in a report from the 22-year study (Torrance, 1980). Tammy had been one of the brightest and most creative first graders, but her teacher and parents dissuaded some of her more imaginative pursuits. By third grade her I.Q. and creativity test scores had fallen into the average range. She dropped out of school in the tenth grade to help take care of her younger siblings and married at 19. She reported no creative achievements, and felt that she was not smart.

Yet, some students were able to maintain their creativity in spite of poverty, racial and gender biases, lack of family encouragement, and other difficulties. Torrance summarized what he found about those individuals' struggles to hold on to or reclaim their creativity in his Manifesto for Children (Henderson, Presbury, & Torrance, 1983; Torrance, 2002).

Implications for Educators

The best lesson that teachers can take away for helping children maintain their creativity come from the words that Torrance gave to children in the Manifesto for Children. The Manifesto is reproduced here in the form of a bookmark that you can cut out, laminate, look at everyday, and give to every student.

Manifesto for Children

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

Know, understand, take pride in, practice, develop, exploit, and enjoy your greatest strengths.

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

Find a great teacher or mentor who will help you.

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

Do what you love and can do well.

Learn the skills of interdependence.

The Manifestos resulted from over 40 years of study of creative individuals.

Torrance wrote them as advice for retaining creativity.

E. Paul Torrance, 1915-2003

In essence, Torrance believed that educators can help students develop into creative, productive adults by taking the following actions:

• exposing them to a variety of learning experiences so that they can find what they love and do well;

• teaching them how to evaluate their own work so as to inoculate them against false or incorrect criticism;

• mentoring students and/or finding mentors for students in their area of interest;

• valuing their uniqueness, while teaching them how to work cooperatively with others.

The Incubation Model

In the late 1960s, Torrance (1969b, 1970) had an opportunity to put his ideas about nurturing creativity to test on a broad scale. The publishers of the Ginn Reading series decided to incorporate a creativity strand into their new Reading 360 Program, and Torrance was enlisted to create the strand (1979). He was eager to change the current curriculum, which only emphasized rational processes, but did not include the processes that he saw as necessary for the creative thinking that our world so sorely needed. He observed,

> ***Little or no attention has been given to the problem of setting in motion and facilitating the incubation processes that seem to be necessary for seeing new connections; enlarging, enriching, and making more accurate one's images of the future; and making productive use of these insights in solving immediate and long range future problems (Torrance, 1979, p. 23).***

The Incubation Model (Torrance, 1979; Torrance & Safter, 1990) is a three-stage instructional model with learning activities before the lesson (or unit), during the lesson (or unit), and at the end of the lesson (or unit). The first two stages should be familiar to educators as similar to other lesson formats. There is a motivating activity to begin with, which Torrance called "Heightening Expectations." Then, the activities that follow carry the students into the heart of the lesson, "Deepening Expectations." The final stage, "Keeping it Going" is where incubation is directly encouraged and where this model deviates the most from others. Whereas most other lesson formats end with a summary, evaluation, drawing to a close, etc., the Incubation Model focuses on keeping the lesson open and continuing. As such, it is like a cliffhanger; the purpose is to keep students thinking past the end of the lesson and past the walls of the classroom.

Figure 1 (below) shows a visual of the model. Although the format is similar to other models, the Incubation Model describes specific warm-up techniques based on creativity research that are designed to increase creative thinking. Please note that the figure is open, with arrows leading out from Stage III, indicating that the learning continues.

Another notable difference is that Torrance chose to describe the activities in each stage using analogies. This both describes the activities more colorfully and emphasizes that creativity is a goal of the model. Does it work?

> ***Field tests of the model reported good outcomes such as this: The children became very enthusiastic about securing information for so many things that they were taking 4-6 library books per week from the school library plus those they found in the public library. This reading program never ended at any one time period. Instead, it acted as a springboard for daily, weekly, and yearly class activities in all subject areas (Plooster, 1972, p. 5).***

Teachers also reported that students who participated in the creativity strand of the Reading 360 Program conducted simple experiments, interviews, and problem solving activities on their own (Torrance, 1979). This is something that had not been observed with other reading programs.

So, why isn't the model widely used? An easy answer is that the emphasis in education returned to skills and rational processes. The results of

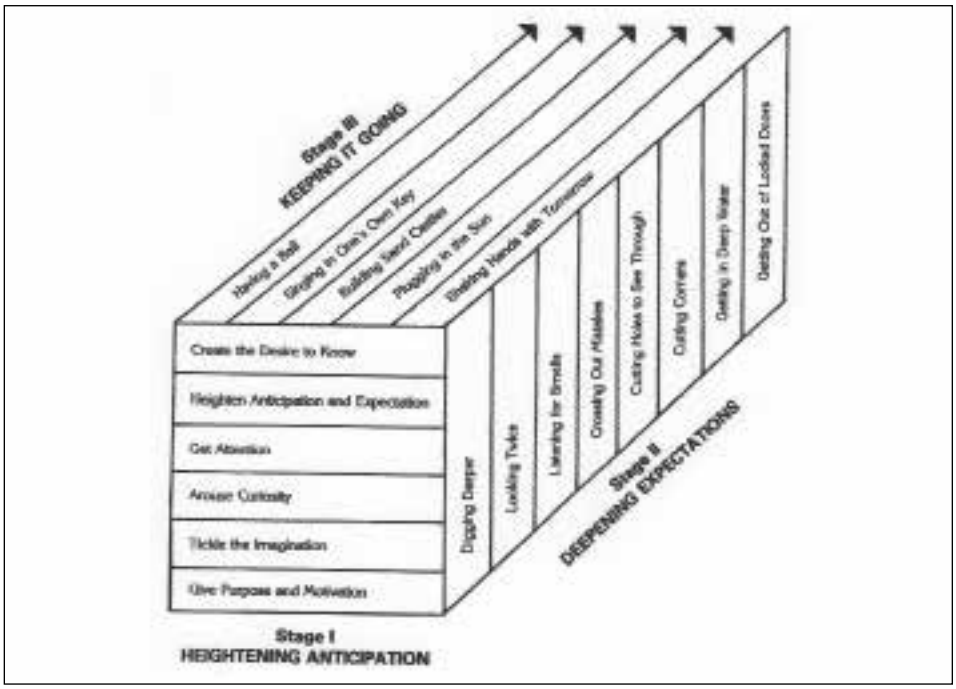

Figure 1. The Incubation Model (Torrance & Safter, 1990)

this emphasis may be seen in what Kim (2011) described as a creativity crisis—fluctuations and a measurable decline in U.S. students creativity scores on the TTCT over time. The research does not tell us the reason for this, but it is reasonable to assume that a shift of focus in schools from creative activities to drill and practice may play a role.

Implications for Educators

The Incubation Model is too complex to be fully described or understood in this article, although interested educators are encouraged to read more from the references listed at the end of this article. However, even without further reading or training, teachers can understand and employ the ideas of beginning a lesson with an interesting hook activity, continuing the lesson for deeper learning, then leaving the lesson open at the end with a question, an idea, a vision, and so on. To help with this, key ideas for activities at each stage are listed in Table 1 (see end of this article). These can be combined to create lessons as indicated in the two lesson descriptions (see right):

The Future Problem Solving Program
(Now Future Problem Solving Program International)

Torrance started the Future Problem Solving (FPS) program in 1974, but the impetus for it came much earlier through the synthesis of two ideas. After the turbulent activism of the 60s, Torrance observed that young people in the early 70s demonstrated a growing disinterest and lack of creativity about the future. He also had participated in the annual Creative Problem Solving Institute (Creative Education Foundation, n.d.) and experienced the power of the Osborn-Parnes Creative Problem Solving method, first developed by Osborn (1953) and later refined by his colleague, Parnes (1967). When the principal of Athens High School in Torrance's hometown of Athens, GA asked him to devise a unit to inspire creativity in students, he put these two

Lesson on molecules moving faster because of heating:

Stage I:
What do you think will freeze faster, a tray of hot water or a tray of cold water? (Confronting ambiguities and uncertainties). Most students will predict that cold water will freeze faster and are surprised when they try it and find that the opposite is true.

Stage II:
Why does this happen? A lesson or lessons on the movement of molecules would follow. One activity could have students wear an H or an O on their chests to indicate a Hydrogen or Oxygen atom. Two Hs and an O should hold hands to show the bond. The teacher should use some visual on a white board or smart board to show a temperature that can go up and down. Students should practice walking faster as the temperature goes up and slower as it decreases.

Stage III:
Do you think this is true of other liquids? How could we find out? Do you think it is true of gases and solids? How could we find out with this air in a balloon? How could we find out with a thick metal strip? Please come to school tomorrow with some ideas for testing these.

Lesson on refugees from wars as immigrants to other countries:

Stage I:
We see reports on the news of people flooding into other countries because of war and strife in their own country. Can you think of examples in different places around the world and at different times in history when this has happened? (stimulating curiosity and desire to know). Why would people leave everything behind to travel to another country? Why would some people in the receiving country oppose this? (looking at the same information from different viewpoints; creating awareness of a problem to be solved).

Stage II:
At this point, the students should look deeper into why refugees leave their homes, places where this has happened, and historical times when this has occurred. The results of these inquiries might be displayed as maps, time lines, and charts (encouraging visualization). The students might role play different refugees and members from receiving countries to represent the different points of view.

Stage III:
Students might be encouraged to talk to friends and family who have immigrated or know someone who has (heightening concern about a problem), propose possible solutions to immigration issues (encouraging solution of collision conflicts), or even volunteer with an agency that assists immigrants (accepting limitations creatively and constructively).

ideas together--student involvement in creatively addressing challenges of the future and the Creative Problem Solving method--and designed the Future Problem Solving Program.

Over the more than 40 years since its inception, the Future Problem Solving Program grew from a program at one high school in Athens, GA to an international program that involves over 250,000 students annually from Australia, Canada, Hong Kong, Japan, Korea, Malaysia, Portugal, New Zealand, Russia, Singapore, South Africa, Great Britain, Turkey, India and the United States (FPSPI, n.d.). The program includes both competitive components and non-competitive curricular components. The competitive components include: 1) Global Issues where teams or individuals research a series of global issues and use the six-step problem solving process to formulate solutions; 2) Community Problem Solving where teams or individuals research and address a real problem in a community; 3) Scenario Writing where individuals write futuristic short stories about one of the issues researched for the year; and, 4) Scenario Performance where individuals create similar short stories as in the former category, but they tell them in 3-5 minutes rather than write them. Participants compete in four age groups: junior, grades 4-6; middle, grades 7-9; senior, grades 10-12; or adult. The non-competitive components include Action Based Problem Solving, which is a non-competitive version of community problem solving and Curriculum-Centered Problem Solving, which has students apply the six-step process to some problem relevant to what they are studying in the standard curriculum. The latter is an activity that a teacher could incorporate into any class to involve students in creative thinking about problems of the future related to what they are studying today.

Recently, Treffinger, Selby, and Crumel (2012) conducted an evaluation of the FPSPI constructing a comprehensive set of questions that key stakeholders—participants, coaches, parents of participants, and alumni of the program—were invited to respond to online. From the data, the evaluation team concluded that, "In summary, FPSPI is a strong, constructive, expanding international program that provides engaging and challenging opportunities for children and youth to learn and apply creative thinking, critical thinking, and problem-solving skills" (p. 60).

Implications for Educators

Educators who are interested in involving their students in the FPSPI can find information about coaches' training, resources, and registering a team from the FPSPI (n.d.) website. But, one need not register a team in order to use the process in the classroom.

The process takes students through research, brainstorming, collaboration, analysis, synthesis, and more as they work on an issue that may take from several class periods to a year, depending on the complexity of the problem and student involvement. The basic six step process includes the following main steps, but each of these can incorporate several smaller steps. A quick example of a lesson will help illustrate the outline to be followed. The topic might come from the curriculum, the news, an issue in the school or community, and so on. For example, if students are studying about global issues and concerned about the situation of immigrants flooding into some countries from war-torn and resource-poor regions, they might begin by researching the issue (according to their maturity level). Then, they would take these steps:

1. Identify the challenges in the issue. Students are guided to brainstorm all of the challenges related to the issue. These might include geographical, political, health, cultural, economic, and historical, to name a few. The field may be narrowed by the content being studied and the age of the students. If students have a hard time naming issues, they may need to do more data gathering.

2. Choose an underlying problem and word it for attack. At this point, students are guided to choose one problem from the list of challenges. They may identify the main problem from their list, or the most urgent one, or the problem which, if solved, would resolve the situation. They may also choose to combine two or more for creative attack. Then, they should word the problem in a way that opens it up for solution. Usually, they begin "In what ways might we…" OR "How might we…" and they can use the abbreviations IWWMW or HMW. Finally, they should include any conditions that are necessary to address, like "How might we provide a safe environment for refugees when they first arrive in a country no matter where it is?" In this case, "no matter where it is" becomes the necessary condition. It is best to examine what conditions are necessary, so that the students' creativity isn't limited by too many of them.

3. Produce solution ideas. At this point, students brainstorm solutions and try to think of as many ideas as possible, hitchhike on the ideas of others, include wild and silly ideas, and suspend judgment. Again, students may find that they have to get more information and go back to the research or reword their problem statement.

4. Generate criteria to evaluate the solutions. Students are guided to brainstorm possible criteria to apply to their solution ideas in order to choose the best. They should be encouraged to think of some generally applicable criteria, such as expense, acceptability, effectiveness, possibility, and so on. In addition, they should attempt to generate some criteria that are specific to the problem, which might include sustainability, cultural acceptance, and speed in implementing the solution.

5. Apply criteria to the solution ideas to select the best solution(s). At this point, students select what they consider their best solutions and the most important criteria to compare. The numbers of solutions and criteria can vary with the age of the students and the complexity of the problem, but a good rule of thumb is to have 10 to 20 solutions and about 5 criteria. Then, students list the solution ideas and the criteria in a grid as shown in Figure 2 on page 8. Students take each criterion in turn to rank the solution ideas. So, for example, if there are evaluating 10 solution ideas, students would rank all of the solutions from 1 (low) to 10 (high) according to the first criterion. Then, they would do the same for the second criterion, and so on. After they use all criteria to rank all solutions, they add each solution's rankings across, resulting in a total score for each solution. The highest score indicates the best solution. There are variations whereby students can give solution ideas tied scores, combine solutions that result in similar scores, and other nuances, but this is the basic idea.

6. Develop an action plan. Finally, students develop a plan to implement their chosen solution. This includes the steps they would need to implement this solution. Again, depending upon the maturity of the students, a more detailed plan might also include people to talk to, possible consequences of actions, costs, a timeline, etc.

Students participating in the year-long Community Problem Solving program or in the Action-Based Problem solving program actually carry out the plan.

Of his many accomplishments, Torrance was proudest of the establishment of the Future Problem Solving Program. He knew that the program has the potential to profoundly affect the many students who participate as well as others whose lives are touched by the participants and their community projects. It is also indicative of where his heart truly lay, in the nurturance of creativity in young people.

The Teacher

From the discussion above, it should be clear that teaching was a priority for Torrance and his students felt this. A quiet, humble man, he was not a dynamic lecturer, nor a lively discussant; he was a mentor, role model, inspirer, and co-learner. His love of learning was infectious.

Torrance's first profession was teaching. He began as a high school teacher, and added counselor, principal, registrar, and dean of men to his educational credentials in time. However, he never lost his interest in classroom interaction, and, in fact, it was deepened through his work teaching college students and working as a psychologist with the Air Force Survival Training Program. Through his experiences, Torrance disclosed, "I became a firm believer in experiential learning, cooperative learning in small groups, learning in all modalities, tolerance of disagreement in groups, the extreme importance of motivation and creative thinking," (Hébert, Cramond, Speirs Neumeister, Millar, & Silvian, 2002, p. 8). The devotion and commitment that his students still have toward him and his work are testaments of the kind of teacher he was.

Through his many years of teaching, first in high school, then in colleges and universities, and even with the jet aces in the survival training, Torrance directly touched the lives of many students. However, he "taught" many more through his writing, talks, and correspondence. Students still remark that his writing is more accessible than that of most academics, and he corresponded with so many people around the world that he had his home mailbox replaced with a toy chest to hold all of the letters he got. He had to hire a secretary to help him respond to all of the mail, and he continued to do that, long after he had retired, until he was physically unable to do so. Although he was always busy, he was never too busy for his students, and his students included everyone who wanted to learn from him.

Some comments from former students reported in E. Paul Torrance: His Life, Accomplishments, and Legacy (Hébert et al., 2002) show his strengths as a teacher:

- He gets a lot of general letters requesting such things as, "send me everything you have on creativity." Of course, he has rooms and rooms full of things on creativity. So he very carefully selects the appropriate articles and photocopies those, packages them and mails them at his own expense. Very seldom does he let two days go by between the receipt of a letter and his response. I would say his greatest strength is his generosity combined with that sense of mission (Vicki Connell, p. 30).

- One of the most memorable things I recall is going into his office one day, needing to see him, and apologizing for interrupting him and having him say, "Jeanette, you'll never find me not busy, but I'll never be too busy to help you," and I always remembered that and learned a great deal from it (Jeanette Parker, p. 29).

- .. . the greatest thing about Dr. Torrance is the positive valuing of his students. As an instructor he was open-minded, valuing, and respectful of your talents, encouraging, and understanding. Anything you'd like to have in a teacher, that was Dr. Torrance" (p. 29).

- He was marvelous at helping me to feel comfortable with the quality of my own insights. He has a quality of being able to give other people what they need, so that they can find the creativity within themselves to pursue their own inquiry. He is selfless in that regard (Tammy Safter, p. 30).

The stories of generosity, respect, sense of mission, encouragement, and understanding are repeated in many stories that students tell about Torrance, the teacher.

One of my favorite stories was told to me by a friend, Joy Anderson Brown (personal communication, 1989), who recounted the first time she met Torrance. At the time, he was the department head for Educational Psychology, Research, Evaluation, Measurement, and Statistics at the University of Georgia. She was a young student who didn't have any idea who he was, but needed to take one educational psychology course. In those days, students had to walk from department to department on campus to get a class card to register for a class, and with buildings spread all over the massive campus, that could be an all day affair. Sometimes, after the student had gotten all of the cards, she found that there was a conflict in her schedule, so she would have to go back and exchange a card. This is what happened to Joy Anderson, and she found herself getting back to the department office at 5:00 pm, after a long and frustrating day, to try to get a card for an educational psychology course. The secretary told her that she would have to come back the next day because they were closed. Joy started crying. Dr. Torrance heard her, and came out to inquire about what was wrong. When she told him, he kindly asked the secretary to give her a class card. The secretary asked her what class she wanted, and she responded, "Whatever class he is teaching." Having found the first kind and helpful person of the day, she knew that she would take whatever course he taught. Dr. Torrance's classes were in high demand, and the class was full, but as the secretary told Joy that, Torrance told the secretary to give her a card for the class. So, Joy went to the

class, still not really knowing who Torrance was or what the class was about. When he wrote the name of the book on the board, Joy raised her hand and asked if Dr. Torrance was related to the author of the book. Later, she reflected on how all of the other knowing students must have cringed at her naiveté, but Torrance grinned and said, "You might say so."

When Torrance retired in 1984 to care for his ailing wife, Pansy, a colleague at the University of Georgia (UGA), Dr. Mary Frasier, established the Torrance Center for Creative, Gifted and Future Studies in the College of Education to continue and expand the work that Torrance had begun. A year later, Dr. Frasier and her staff at the Torrance Center organized a two-day retirement party and over 250 students, friends, family members, and colleagues traveled from all over the country to the University of Georgia to participate in the event. Torrance was asked to give a lecture as part of the event, and it became the first of a series of annual lectures that the Torrance Center still sponsors. As the topic of his lecture, Torrance chose to focus on the careers and contributions of his global network of students, whom he saw as the embodiment of his teaching and as those who would continue to spread creativity around the world.

As one of his former students and the one lucky enough to be hired to the position he left vacant at UGA, I was fortunate that he lived near the university and was so generous with his time, resources, and ideas to help me so much, especially during those early years. I was well aware that I had enormous shoes to fill, and did not have any pretentions that I could fill them, but without Torrance's support and help, I would not have been able to do the job that I wanted to do to honor him. Always the teacher, he shared his materials, articles, knowledge and experiences. Those 14 years from 1989, when I was hired, until 2003, when he passed away, were a priceless education for which I paid no tuition and had one-to-one instruction. Until he got sick, he gladly welcomed my classes each semester as we took a field trip to his house. He took obvious delight in interacting with the students, and they were clearly in awe of him. They always read some of his work and were admonished to prepare some question ahead of time, but even the most talkative students were often quieted in his presence at first. However, his soft spoken, gentle manner soon relaxed them. He always gave each student a gift, too. Sometimes it was a copy of one of his books, or some articles, or even some small souvenirs that he had collected from his visits around the world. He delighted in giving each student something, unaware that he had given them the most memorable gift through his interaction with them.

Implications for Educators

The implications for teaching should be clear. Our strongest message to our students is how we treat them and others, and how we lead our lives. Unconditional regard, universal respect, generosity, commitment, sense of mission, dedication, and love of learning are some of our greatest gifts to our students.

Solution Ideas \ Criteria →	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Total
1.	10	9	7	9	9	44
2.	7	2	1	5	10	25
3.	1	4	6	7	4	22
4.	3	1	4	1	6	15
5.	5	6	8	10	2	31
6.	2	10	5	2	3	22
7.	6	3	9	4	1	23
8.	8	5	10	3	7	33
9.	9	7	2	8	5	31
10.	4	8	3	6	8	29

Figure 2. FPS Grid showing ten solution ideas being ranked according to five criteria, with 10 as the highest score and 1 as the lowest score. In this case, solution idea #1 is the best according to the criteria.

The Man

So much of Torrance the man has been woven throughout the accounts of Torrance the scholar and teacher, just as his personality was so woven through his work. In trying to think about how to depict Torrance the man, I thought about Czikszentmihalyi's (1996a, 1996b) ten antithetical traits of creative people. Czikszentmihalyi argued that creative people are complex and often exhibit paradoxical traits. I found that to be true of Torrance, so I used Czikszentmihalyi's list of traits to frame this discussion.

1. Creative people have a great deal of physical energy, but they're also often quiet and at rest. As an adult, Torrance was not a very active man. He was a quiet scholar who spent hours reading and writing. However, he spent so many hours working, even after he had retired and up into an advanced age, that he exhibited more energy than many others.

2. Creative people tend to be smart yet naive at the same time. There is no doubt that Torrance was smart. He was an excellent student throughout school and was encouraged and praised by his teachers. Yet, he could be incredibly naïve and trusting of people, to the point that people sometimes took advantage of his kindness and used him financially. For example, he reported that the nurses who were hired to help care for his wife, Pansy, always asked to borrow money and didn't pay it back (Millar, 2007). There were other such instances, and the fact that they happened over and over demonstrate Torrance's optimism and naiveté.

3. Creative people combine playfulness and discipline, or responsibility and irresponsibility. Torrance loved to laugh, and those who knew him often remarked about the twinkle in his eyes when he was tickled about something. He also seemed to have the wonder of a child when exploring new ideas, being open to new thoughts and possibilities that most psychologists would not entertain. However, he was very organized and business-like in his professional work. He kept meticulous files and records, was scrupulous in his research, and was, by his own admission, a workaholic.

4. Creative people alternate between imagination and fantasy, and a rooted sense of reality. No one could make the creative contributions that Torrance made without a vivid imagination of what could be. At the same time, he was very aware of the realities of his profession. For example, he was most interested in developing creativity in individuals, but he knew that he would need the data to determine if his methods worked, and to prove to his colleagues that they did. He began his work as a psychologist in an era of behaviorism, where everything had to be observable and measurable. So, he developed creativity tests. He both imagined creating such tests and carried out the long and laborious process to do so.

5. Creative people tend to be both extroverted and introverted. Most people who knew Torrance would probably consider him an introvert because of his quiet, unassuming manner and the hours he spent alone in his study. However, if you consider the meaning of extroversion in the Jungian sense of enjoying the company of people and being energized by interactions with people, then I believe that Torrance also displayed those characteristics some of the time. He loved interacting with students, and especially with children. He and his wife Pansy volunteered to teach Sunday School at their church, and they welcomed children home to share the many children's books in their library.

6. Creative people are humble and proud at the same time. One of the most outstanding traits that Torrance displayed, and one that is often mentioned by those who knew him, was his humility. However, those of us who knew him well also saw that he sometimes felt justifiable ire about what he saw as unfair attacks on his work, blatant disregard of his contributions, or credit claimed for ideas he had written about years earlier. Clearly, he had pride in his work, but he was a humble man.

7. Creative people, to an extent, escape rigid gender role stereotyping. Torrance's marriage always seemed like a partnership of equals. Pansy and Paul worked together on projects, around the garden, and in the house. There did not appear to be strict gender roles in their relationship. Both played the role of nurturer when the other was ill, and both respected the other's ideas and input. Torrance exhibited tender sentimentality when the situation called for it, but he could be an objective scientist at other times.

8. Creative people are both rebellious and conservative. Torrance was a product of his upbringing, so he was a good southern gentleman with a strong Baptist faith and a love for family and southern cooking. Yet, he was open-minded, accepting people of different races, faiths, and sexual orientations without judgment. He recognized the inherent creative gifts in African-American children from the projects when the most broad-minded educators were focusing on their disadvantages. He welcomed female colleagues and students to study with him without prejudice. He had positions of authority throughout his life, but he bucked the authority when he disagreed with their rules. For example, as department head he was chagrined about what he saw as the graduate school's over-dependence on GRE scores for admission. So, he was able to get some students admitted based on accomplishments, then tracked their successes and presented this information to the graduate school. He felt that this resulted in a more open and holistic consideration of applicants afterward. No doubt because of his habit of quiet rebellion, he was a card-carrying charter member of the Giraffe Society, which believed in "honoring all Americans who stick their necks out for the common good" (Millar, 2007).

9. Most creative people are very passionate about their work, yet they can be extremely objective about it as well. Several people who reflected on Torrance remarked about his commitment and sense of mission (Hébert et al., 2002; Millar, 2007). However, one cannot be the lifelong student that Torrance was without reflecting on the work, changing when learning something new, and adjusting the things that do not work. This he did.

10. Creative people's openness and sensitivity often expose them to suffering and pain, yet also to a great deal of enjoyment. It was clear to those close to Torrance that his openness and sensitivity often made him vulnerable to hurt from criticism. He was stung by what he saw as specious criticisms or misunderstandings, but the criticism did not deter him. In fact, Renzulli credited Torrance with helping him to understand that when you are breaking new territory you will be criticized, so that you should work more in the areas for which you are being criticized—"because it is probably the only aspect of your work that is truly unique" (Millar, 2007, pp. 151-152). At the same time, Torrance's openness and sensitivity gave him delight in life. Among other things, he loved his family, his faith, his cats, his garden, food, books, and a good laugh.

In Conclusion—Torrance Was a Giver

Born to share croppers in rural Georgia, Torrance didn't have the money to go to college, so he interspersed enrollment with periods of working and saving. At times, he took correspondence courses and once even enrolled as the only man in a summer course at the Georgia State College for Women (Millar, 2007). Perhaps his own struggles to continue his education inspired his empathy for others. So no one knew, least of all the students who benefitted, that he had personally paid for several graduate students to receive their educations at the University of Georgia. They thought they had received assistantships. It was only when, in his later years, Torrance was audited that his secret generosity came to light.

Torrance had a childhood curiosity that developed into a drive to know, and as a result, he gave the world significant works in creativity research, tests, and programs. He loved learning and teaching, and this he gave to his students. He loved life, and he gave of himself. When he passed away in 2003, Torrance left significant works to the University of Georgia library, several funds to the Torrance Center, the College of Education, and the University. Most significantly, he left a legacy that the Torrance Center, his students, colleagues, and friends hope to continue.

Note: I wish to thank Torrance's good friend and colleague, Joan Franklin Smutny, for all of the work that she does to further the spread of creativity through her writings, her work with children as the Director of the MidwestTorrance Center for Creativity and Center for Gifted, a Northern University Partner in Illinois, through her establishment of the International Torrance Legacy Awards, and through her creation of this journal. She, too, is a giver.

Table 1. Suggested Activities for Each Stage of the Incubation Model (Torrance, 1979, pp. 28-29, 31, 33).

Stage I: Heightening Anticipation	Stage II: Deepening Expectations	Stage III: Keeping It Going
1. confronting ambiguities and uncertainties; 2. questioning to heighten expectation and anticipation; 3. creating awareness of a problem to be solved, a possible future need, or a difficulty to be faced; 4. building onto the learners' existing knowledge; 5. heightening concern about a problem or future need; 6. stimulating curiosity and desire to know; 7. making the strange familiar or the familiar strange; 8. freedom from inhibiting sets; 9. looking at the same information from different viewpoints; 10. provocative questioning to make the learner think of information in new ways; 11. predicting from limited information; 12. purposefulness of the lesson made clear, showing the connection between the expected learning and present problems or future career; 13. only enough clues to give direction; 14. taking the next step beyond what is known; 15. physical or bodily warm-up to the information to be presented.	1. heightening awareness of problems and difficulties; 2. accepting limitations constructively as a challenge rather than cynically, improvising with what is available; 3. encouraging creative personality characteristics or predispositions; 4. practicing the creative problem-solving process in a disciplined systematic manner in dealing with the problem and information at hand; 5. deliberately and systematically elaborating upon the information presented; 6. presenting information as incomplete and having learners ask questions to fill gaps; 7. juxtaposing apparently irrelevant elements; 8. exploring and examining mysteries and trying to solve them; 9. making outcomes not completely predictable; 10. predicting from limited information; 11. search for honesty and realism; 12. identifying and encouraging the acquisition of new skills for finding out information; 13. heightening and deliberately using surprises; 14. encouraging visualization.	1. playing with ambiguities; 2. deepening awareness of a problem, difficulty, or gap in information; 3. acknowledging a pupil's unique potentiality; 4. heightening concern about a problem; 5. challenging a constructive response or solution; 6. seeing a clear relationship between the new information and future careers; 7. seeing the connection between the new information and career possibilities; 8. accepting limitations creatively and constructively; 9. digging still more deeply, going beneath the obvious and accepted; 10. making divergent thinking legitimate; 11. elaborating the information given; 12. encouraging an elegant solution, the solution of collision conflicts, unsolved mysteries; 13. requiring experimentation; 14. making the familiar strange or the strange familiar; 15. examining fantasies to find solutions for real problems; 16. encouraging future projections; 17. entertaining improbabilities; 18. creating humor and seeing the humorous in the information presented; 19. encouraging deferred judgment and the use of disciplined procedures of problem solving; 20. relating information to that of another discipline; 21. looking at the same information in different ways; 22. encouraging the manipulation of ideas and/or objects; 23. encouraging multiple hypotheses; 24. confronting and examining paradoxes.

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Visions of the Future: The Work of E. Paul Torrance

by Sarah Sumners

> ***"The demands of the times, national needs, recent discoveries, and a few sustained research efforts... have fostered among educators in all fields and at all levels an unprecedented interest in creativity".***
>
> *(Torrance, 1963, p. 3)*

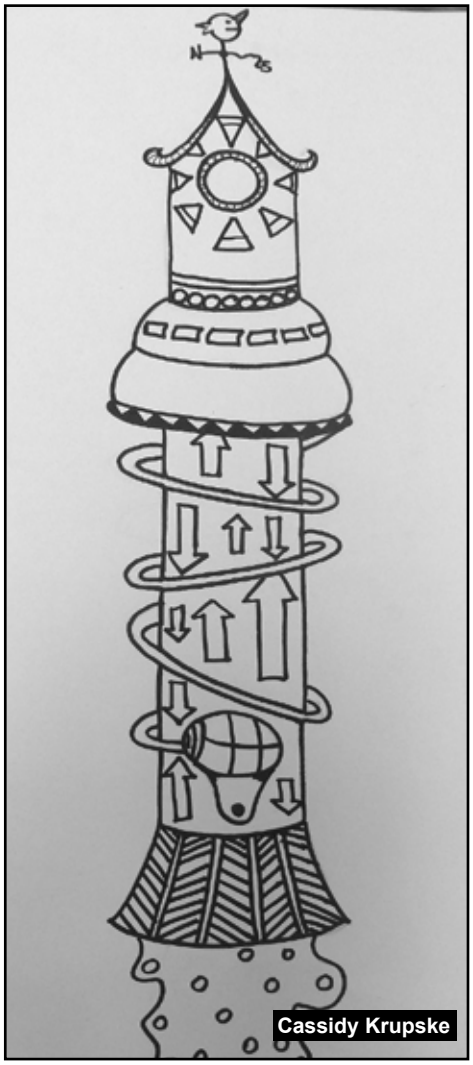
Perhaps now more than ever, the words of Dr. E. Paul Torrance ring true. Our society is dependent upon the generation of creative ideas to solve increasingly complex conundrums, to improve our everyday lives, and to make the world around us a better place to live. If it is possible to develop this kind of thinking in students, don't educators have a responsibility to do so?

Why Creativity, Why Now?

Noted over 40 years ago, the evidence for the unprecedented interest and need for creativity, which echoes through the halls of academic institutions and fortune 500 companies alike, is even greater in the 21st century. In IBM's 2010 survey of more than 1,500 CEO's from 33 industries in 60 countries, CEOs identified creativity as the most important attribute for organizational leaders to possess. If the leaders of business and industry are to be successful, they must embody creative leadership.

Additional global IBM studies in 2011 and 2012 confirmed the importance of collaboration and innovation throughout various industries worldwide. These studies affirm that business leaders prize a talented workforce with the values and skills to innovate, collaborate, and react flexibly. Over the last several decades, the modern world has seen an economic shift away from manufacturing toward a service-based economy focused on knowledge, information, and innovation (Partnership for 21st Century Skills, 2008). Economists (c.f. Economic Commission for Africa, 2009; Florida, 2002 & 2005; Friedman, 2005) have emphasized the need for creativity and innovation in any society that hopes to retain an economic and political advantage in the years ahead. Indeed, Torrance (1977) noted, "It is becoming increasingly clear that nothing can contribute more to mental health and the general welfare of our nation and to the satisfaction of its people than a general raising of the level of creativity" (p.35).

Why, then, do we continue to see evidence of a decline in creative thinking scores of children in the United States (Kim, 2011)? If it would be wise to educate future workers about how to infuse creativity and innovation into their jobs (Basadur, 1997; Eger, 2006; Robinson, 2001), then why are we not doing so? While the answers to these questions are complicated by policies and practices at all levels of education, it is clear that education as an institution has yet to fully embrace the mechanisms for developing creative leadership. The solution may therefore lie in the careful cultivation of creative teachers.



How Can Teachers Foster Creativity in the Classroom?

A methodical literature review of the role of teachers in promoting creativity in the classroom reveals several research-based conclusions that highlight the important role teachers play in maximizing creative potential (Davies et al., 2014). In general, fostering creativity in the classroom can be as simple as displaying a positive attitude towards creativity, modeling creative behaviors, teaching strategies and techniques, and fostering a safe and resourceful learning environment.

Many of these techniques are in line with Torrance's (1963, 1969, and 1977) assertions on how teachers can promote creativity in the classroom. For instance, modeling creative behavior can be accomplished by merely asking and responding to questions in a manner that does not rely fully on rote memorization. In a science lesson, instead of asking, "What is the order of the planets in our solar system?" the teacher who wants to promote productive and divergent thinking, a necessary component of creativity, might say, "Why or how did the order of our planets come to be?" They may further challenge their students' imagination by posing a scenario: "Suppose the planets were knocked out of order; what might be the immediate result and what might happen years from now? How would life on Earth be different tomorrow or in 100 years?"

Building positive relationships with students supports the establishment of a psychologically safe creative learning environment where children can express their ideas freely and without judgement. To do this, teachers must be willing to "permit one thing to lead to another, to embark with the child on an unknown adventure" (Torrance, 1977. p. 26). As part of this adventure, we should celebrate and recognize the integral part we play in creating a classroom learning environment that allows our students to tap into their inborn potential. An affirming, non-threatening climate that fosters creativity empowers students to realize their potential and enhance their creative abilities. Teachers should focus on each child's creative potential rather than products such as grades that often denote academic achievement. This enables us to more appropriately address the individual educational needs of each child.

What Makes An Accepting Classroom Atmosphere?

Creativity has the potential to benefit all aspects of an organization's functions (Amabile, 1998). One way to understand the interplay between creativity and the organization is through the lens of organizational climate, or the patterns of behavior, attitudes, and feelings that exist within an organization. As mentioned before, all attempts to maximize creativity in the classroom are dictated by the classroom climate, a key ingredient of which is tolerance. An intolerant classroom can serve to squelch creative ideas as "children are afraid to think any except the most obvious ideas, if they do not feel it safe" (Torrance & Myers, 1970, p. 104). Creative children and adults require a more tolerant and permissive classroom learning environment (Florida, 2004), thereby reinforcing the need for teachers "to provide chances for children to learn, think, and discover without threats of immediate evaluation" (Torrance, 1977, p. 25).

Tolerance and appreciation for diversity in the classroom serve to increase opportunities for creative undertakings (Runco, 2007, p. 151). Practically speaking, Torrance and Safter (1990) noted, "Perhaps the most important response a teacher can make to a pupil is to be respectful of the ideas and questions he presents" (p. 15). Guilford (1950) recognized creativity as a natural resource to be cultivated through education, but only if the teachers who tolerate and foster creative thinking in their classrooms can overcome the prevailing goals of education. To foster such a climate teachers should focus instruction on encouraging students to examine information from different perspectives, to dig deeper, to not be afraid to make guesses, to become more passionately involved in the problem at hand, to puzzle over baffling and confusing information, and to have fun (Torrance, 1977).

How Can Teachers Enhance Classroom Creativity?

Perhaps the most widely used model for fostering creative thinking in the classroom is the Creative Problem Solving model (CPS), developed by Alex Osborne and Sidney Parnes in the 1950's. A model for tackling a problem or task from a creative perspective, CPS is comprised of the 6-steps outlined below (Parnes, 1981):

Creative Problem Solving Model (CPS)

1. ***Objective Finding:***
Identification of the goal, challenge, or wish

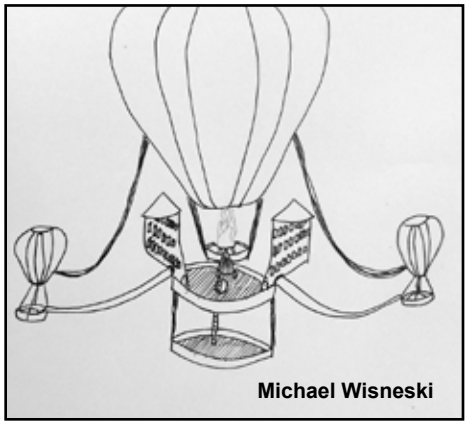
2. **Fact Finding:**
Gathering data

3. **Problem Finding:**
Clarifying the problem

4. **Idea Finding:**
Generating ideas

5. **Solution Finding:**
Selecting and strengthening solutions

6. **Acceptance Finding:**
Developing an action plan.



Michael Wisneski

Several studies have shown the effectiveness of training teachers to employ disciplined and deliberate models, tactics, and strategies, like CPS, to maximize the creative potential of their students. Torrance and Safter's (1990) Incubation Model of Teaching (IMT) emphasizes creative problem solving through collaborative learning in a three-stage process:

(1) **heightening anticipation and awareness of real-world issues along with expectations for learning;**
(2) **understanding and knowledge assimilation;**
(3) **incorporating the new knowledge into existing schemas, and the momentum of its application.**

Specific activities within the model are designed to facilitate creativity at each step (before, during, and after the lesson) and to help students practice their creative thinking skills while studying core content. Below are sample creative strategies offered through the lens of the Incubation Model of Teaching (Torrance & Safter, 1990).

Highlighting the essence.

When attempting to generate creative ideas towards solving a problem, children often become overwhelmed with the number of ideas and solutions generated by their classmates and even in their own minds. One deliberate and organized way to guide children towards more elegant solutions is by teaching them how to highlight the essence of those ideas and solutions through focusing on their attributes and listing them. Consider the IMT example that poses the question, "Can computers think?" (p. 51). For high school students, groups can work together to determine the defining characteristics of humans through such inquiries as, "What are the essential characteristics of being human?" They would then list the essential attributes needed to be considered a human. Finally, they would group these attributes into categories (e.g., physical, mental, and behavioral properties). By exploring the distinguishing characteristics of humans, they can begin to build a definition of what it means to be a human.

Making the familiar strange and the strange familiar.

We can encourage the search for elegant solutions to problems through using analogous thinking in the classroom or drawing connections and associations between seemingly disparate ideas. In this way, students apply ideas from one category or context to another in order to generate new insights from a fresh perspective by looking beyond the obvious. Simple questions such as "How is celery like a tree?" or "How is a gas station like a grocery store?" can help them generate analogies between seemingly different ideas or categories of ideas. One sample IMT lesson involves the following:

> ***Place objects, posters, tactile items, etc., around the room. Allow students to examine them and ask questions. When students ask what a spider and a web could have to do with English, return the question by asking, "What relationship does a spider have to a web?" Draw out comments such as creator-creation; animal-home. Ask what the spiderweb relationship could have in common with a composer and an opera. Encourage discussion about the tactile representations around the room, their differences, their interrelationships, and how they could be patterned in verbal analogies (Torrance & Safter, 1990, p. 98).***

Visualize it richly and colorfully.

One strategy infused throughout the IMT text is that of visualization, or the creation of images in our mind. Visualization is a technique we can use in the classroom to increase our students' imagination. As Torrance and Safter (1990) described it, "The ability to visualize an object as having more than one function, to visualize words and ideas, are the richness and colorfulness of imagery that is essential to success in many areas of creative achievement" (p. 79). The development of imagination in children is an effective way to maximize creative potential because it generates feelings and emotions. One easy way to facilitate creative imagination is through the use of guided imagery, or the teacher's use of careful instruction to assist students through the process of creating images in their own minds. The IMT text provides an example of a simple guided imagery:

> ***[Ask] students to close their eyes and picture a place they love, but have not seen for some time. See it clearly, in much detail. Then ask them, without their speaking to anyone, to list everything about this place that appeals to them. Make this list very quickly. Look back over the list. Are these particular emotions evoked because of anything on their list? Discuss the lists and their associations. Then ask students to imagine that they have never known this place. Try to erase the memory of all of its associations. What would they have missed in the past? How might they be different people today? In what ways might "their" place help to form them in the future? (p. 83)***

Here, the process of guided visualization incorporates not only the use of imagination, but also analogous thinking and attribute listing. Take note of the questions used to evoke emotion in the imagination process.

Another popular way for guiding visualization is through the use of the encounter method. Encounter consists of five questions that teach students how to develop empathy and utilize their sensory imagination by asking questions of

(1) **identity,**
(2) **awareness,**
(3) **isolation,**
(4) **risk or danger, and**
(5) **wisdom.**

For instance, students can be asked to imagine that they are a piece of paper money, to close their eyes and imagine the answers to the following questions:

1. What kind of paper money are you?

2. What do you see? Hear? Smell? Taste? Feel?

3. You are away from the rest of the paper money. Why?

4. You hear a loud noise nearby. What do you think it is? What have you learned about? What would you like to know?

Other strategies and tactics to improve creative thinking in school include the use of metaphors, changing your perspective, creative dramatics, and "thinking big". (For more examples of strategies to infuse creative thinking into curriculum see Starko, 2014; Runco, 2004; Sternberg & Williams, 2003; Torrance, 1962). We will now look at just one of these tactics, building an image of the future.

What Does The Future Hold For Classroom Creativity?

Speaking of imagination, or our ability to transcend time, space, and circumstance in our mind, Torrance noted that "a person's image of the future may be a better predictor of future attainment than his past performances" (Torrance, 1983, p. 72). Positive images of the future are the forces that motivate humans to take action, to achieve, and to be courageous (Torrance, Weiner, Presbury, & Henderson, 1987). Indeed, the importance of imagining ourselves in the future is evident in research journals and trade magazines alike. Note an example from modern culture in the advice given by Sara Blakely, founder of Spanx, on how to achieve success:

> ***Think about what success looks like to you. Get a specific mental picture. Are you standing on the balcony of a house you can finally afford? Are you talking with world leaders? I saw myself on a stage, talking with Oprah. I didn't know what we were talking about, but I envisioned that. And then I spent the next 15 years filling in the blanks. I never dreamed Oprah and I would be talking about footless control-top panty hose! (Booth, 2014, pp. 202-204)***

It stands to reason that if we can picture ourselves achieving great things in the image of our mind, then we are more likely to strive to achieve greatness. Positive images of the future serve as an intrinsic motivator for future achievement. There is little doubt that "the images of the future held by today's young people will determine what the future will be like" (Torrance & Safter, 1990, p.11). If the ultimate goal of creativity is to make us better humans, then teachers should "seek out the child's own best motivations and possibilities and guide these to the most fruitful development" (Torrance, 1968, p. 77).

Conclusion

Decades later, the message of Paul Torrance cannot be understated: Creativity is for everyone and it should be the goal of every teacher to help our future leaders maximize their creative potential, starting now! The beauty of his writing lies in his ability to translate complicated research and psychological constructs into everyday language that is easily accessible and digestible. In most cases, his writing almost seems poetic, reading smoothly and elegantly, with no pretense or smugness. Now, more than ever, we need people in society who understand and can advocate for the spread of creativity and its impact on humanity. To carry the message of the "Creativity Man" to anyone who will listen, you need only close your eyes and imagine….

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Little Leaps: Weaving Creativity into the Classroom

by Cyndi Burnett and Jonathan Garra

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

--E. Paul Torrance, Manifesto for Children

Introduction

This paper is a story about three generations of teachers and how they built on each other's work to evolve the creativity Leap skills identified by E. Paul Torrance (1979). In telling the story, the paper also provides an overview of these skills, and demonstrates how they might be used in any classroom.

Second Generation Torrance

Mary Murdock was a vivacious, intelligent, engaging Southern belle from the mountains of North Carolina. She was also one of E. Paul Torrance's doctoral students in the 1980's, and as such, she considered herself a "second generation" developer of some of the seminal work of her mentor.

Mary Murdock was the instructor for my first graduate course at the International Center for Studies in Creativity (ICSC) at SUNY Buffalo State. Although I didn't realize it at the time, everything she did in that class underlined her belief in the importance of falling in love with something. She spent her career imparting the knowledge, passion, and creative teaching and learning that Torrance had sparked in her, and I am truly grateful to have been one of her students.

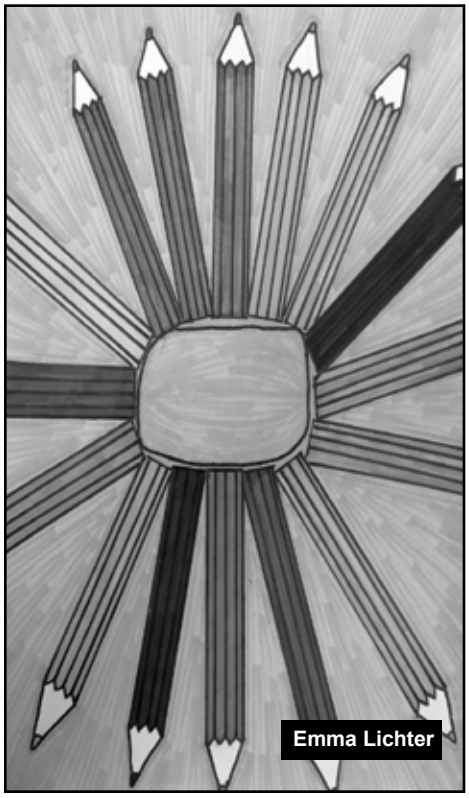
My first class was called Foundations of Creative Teaching and Learning. Even though I had a Bachelor's degree in theatre and was therefore used to highly interactive education, this class was a revelation. It was an ongoing dialogue—authentic, meaningful, and engaging.

The core text, *Making the Creative Leap Beyond* (Torrance & Safter, 1999) defined, described, and backed with ample research a set of 18 skills called the Leap or Beyonder skills (see table 1). This set of skills goes beyond the standard definition of creativity – generating novel and useful ideas – and dives into a rich and colorful depth of creative thinking skills. In class, we learned to develop these skills through trial and error, and with a great deal of laughter. We discussed the importance of these skills in our educational system and how we might use them as a process to teach any particular content. I fell in love with these skills in Mary's class and I have continued to develop, build upon, and strengthen this essential skill set within my own work in the field of creativity.

Third Generation Torrance

Shortly after graduation, I was brought on as a full time lecturer at the ICSC. Being just two office doors away from Mary meant frequent impromptu meetings on creative teaching and learning. My knowledge and understanding of the Leap skills continued to develop in theory, through conversations, and in practice (in my own undergraduate classroom). I was fortunate enough to have the first look at the many drafts that she and our colleague, Susan Keller-Mathers, wrote about the Leap skills (Murdock & Keller-Mathers, 2002; 2008a; 2008b), and we would engage in deep debates on how they might work most effectively. I had a passion for bringing these skills into education, and thanks to Mary, I felt fully equipped with the understanding and experiences to do so.

Unfortunately, in 2010, Mary Murdock lost a long battle to breast cancer. It was devastating to lose a teacher, friend, and mentor. At the same time, she empowered me to continue to develop that spark that Torrance had instilled in her to make a difference in education. I felt I had a responsibility to take her work, and the work of Torrance, and continue to move it forward.



Skills on trial

This empowerment and responsibility fueled my intrinsic motivation. I began conducting workshops and presentations for teachers on how to bring the Leap skills into the classroom. I would begin my sessions by asking teachers to list lessons they teach. Then, I would provide them with the Leap skills. Finally, I would ask them to pick a lesson, and then a skill, and ask how they might weave those together. For example:

> ***Content: Lifecycle of a Butterfly***
>
> ***Creativity Skill:***
> ***Visualize it Richly and Colorfully***
>
> ***Weave:***
> ***Have students visualize and draw the process—an egg, to a caterpillar, to a chrysalis, to a butterfly.***

This same content would look much different if another skill was applied. For example:

> ***Creativity Skill:***
> ***Enjoy and Use Fantasy***
>
> ***Weave:***
> ***Imagine you had a butterfly that could talk to you. What would be all the things she would say as she progressed through her growth?***
>
> ***Creativity Skill:***
> ***Make it Swing! Make it Ring!***
>
> ***Weave:***
> ***Have students reenact the life of a butterfly through movement and noise. What would it sound like? How would she move?***

This activity would quickly engage educators and demonstrate that creativity could be brought into the classroom with relatively little time and effort. Some teachers would leave my sessions feeling empowered just by understanding the Leap skills and acknowledging the opportunities to bring them into the classroom. Others felt reluctant to make the "leap" on their own. They needed more guidance. "Where can we find more tools and techniques?" they asked. And I went on a search for answers.

Skill	Definition
Produce and Consider Many Alternatives	Generating many options.
Be Flexible	Generating different categories of ideas.
Be Original	Coming up with unique ideas.
Highlight the Essence	Focusing on the absolutely essential.
Elaborate – But Not Excessively	Developing details or ideas.
Keep Open	Resisting premature closure.
Be Aware of Emotions	Recognizing emotional cues.
Put Your Ideas in Context	Putting information into a bigger framework.
Combine and Synthesize	Putting new connections together.
Visualize it – Richly and Colorfully	Using vivid, colorful imagery.
Enjoy and Use Fantasy	Imagining, playing, and considering the nonexistent.
Make it Swing! Make it Ring!	Using your full range of senses.
Look at it Another Way	Seeing from a new or different perspective.
Visualize the Inside	Describing the inside of things.
Break Through – Expand the Boundaries	Changing the paradigm.
Let Humor Flow and Use It	Responding to incongruities and surprises using humor.
Get Glimpses of the Future	Imagining possibilities that do not yet exist.

Table 1. Creativity Skills (adapted from Torrance & Safter, 1999)

Weaving Creativity into Every Strand of Your Curriculum

Fortunately, the answers were right in front of me. They came from the participants in my workshops, my graduate students, creativity experts I had been working with, and even in the way I taught my own classroom! At this point, I teamed up with my colleague, Julia Figliotti, to capture these ideas, and make them accessible. We were in search of ideas to use not just in one type of classroom, but any classroom! Over the next three years, I attended conferences and ran workshops for teachers on creativity skills. I ran many of these workshops with colleagues, including Susan Keller-Mathers, my long-time friend and creativity partner. At each event, we made a conscious decision to collect data from the participants. In addition to the face-to-face events, Julia and I tapped into social networks. We asked teachers, "How might you weave _____ skill into your content?" During that time, we collected over 1500 ideas which we condensed down to 750 and laid out in a teacher-friendly format—a book called *Weaving Creativity into Every Strand of Your Curriculum* (Burnett & Figliotti, 2015). Here are some examples of the ideas that were generated (used with permission):

Skill:
Enjoy and Use Fantasy

• Watch old science fiction videos and TV shows in class and see what has actually been invented.

• Have students imagine, write, or act out a conversation with a historical person.

• Have students write a familiar story in a fantasy setting.

Skill:
Highlight the Essence

• Ask students, "In 10 words or less, what did you learn from that assignment?"

• Find a picture that symbolizes class concepts.

• Have students write a review in a descending countdown using 16 words, 8 words, 4 words, and 2 words.

Skill:
Look at it Another Way

• Have students write alternative endings.

• Change the gender of a character.

• Tell both sides of the story.

Skill:
Be Original

• Give a weekly award for the most original idea.

• Have students put two ideas together to make a new idea.

• Have students think of all the ordinary ways to complete a task. Then ask them to do it in an unordinary way.

Skill:
Be Aware of Emotions

• As a class, make a list of all the ways to express emotion without saying anything.

• Pick out several phrases that could be interpreted on the basis of emotional context. Discuss.

• Ask students to read a passage and become detectives, figuring out which words indicate how the character is feeling.

Skill:
Make it Swing! Make it Ring!

• Create a song based on class concepts or topics.

• Ask students to dance a math equation.

• Have a 30 second dance party.

Skill:
Get Glimpses of the Future

• Read Futuristic blog posts and bring them into class.

• Have students wish up new apps and computer programs.

• Have students imagine being the first person to land on Mars. What does the planet look like from your perspective?

Skill:
Breakthrough- Extend the Boundaries

• Move the chairs and tables around the classroom in an unusual way. Debrief on what it felt like to sit outside the normal paradigm.

• Make the last question on the test: "Is there anything on this test you would like to question?

• As a class, practice connecting things that don't belong together.

Weaving highlighted 12 out of the 18 Leap skills. It also captured ideas for four other skills identified in creativity literature: mindfulness, tolerating ambiguity, embracing challenges, and curiosity. Although the work was published a few months prior to writing this paper, the feedback from educators has been overwhelmingly positive.

First, educators find the language of Torrance's skills easy to understand and apply. Second, when they are stuck on how to make a lesson more engaging, they can easily open the book and find a technique that they can quickly apply. Third, many educators who read the work realize that they already do many of the ideas we collected. In fact, a few educators have told us that they didn't think they were creative, but as a result of seeing what activities they already do, their confidence has grown. Finally, they now have the name of a creativity skill that identifies what they are doing.

The one downside to this work is that we did not provide any elaborate examples on how these skills and techniques have been brought into specific lesson plans. Fortunately, this will be our next phase of developing the materials around the Leap skills. Once again, I find myself surrounded by students, colleagues, and practitioners who are ready to help us build this resource!

I was fortunate to become a Third Generation Torrance student, learning from a wonderful mentor. It has been my goal, among other things, to pass the Leap skills onto my students as Mary Murdock passed them onto me. And I am humbled to see that I have been able to do just that.

Fourth Generation Torrance

One particular graduate student, Jonathan Garra, has taken the Leap skills to the next level in his middle school classroom. Last semester, he was a student in my Foundations of Creative Teaching and Learning graduate course, and just as my spark was ignited 17 years ago in Mary Murdock's class, his spark was lit in mine. Every time I spoke with him, he shared another lesson he had

transformed using the creativity skills. Below, he has outlined two different lessons to showcase in more detail the work he has done.

Content: European Exploration and Settlement

Leap Skill: Look at It Another Way

Content Goal: To understand the impact of European settlement on Native Americans and Europeans

Creativity Goal: To see the same event from a variety of perspectives

At the start of my seventh grade American history class, students are given Christopher Columbus' diary entries (Columbus & de las Casas, 1989) from October 11 to October 15, 1492. The entries describe in detail Columbus' landing in the "New World" and the crew's interactions with Native Americans. Students read the entries as a class, specifically noting some highlighted elements. After working with Columbus' diary and learning about his experiences encountering Native Americans, students read selected excerpts of Michael Dorris' Morning Girl (1992), which is a fictionalized account of a young Taino girl. The book details Morning Girl's daily life before the "discovery" of America. This provokes students to look at this seminal historical event in a different way.

Finally, students are asked to compose two stories. The first should be a story that depicts the point of view of a Native American living in the Bahamas, experiencing Columbus' arrival first-hand. Students consider and use some of the facts they learned from Columbus' diary entries, but primarily, they try to capture the significance and emotions of the moment from the point of view of the Natives. Secondly, students compose a similar story, but from the perspective of a European encountering Native Americans for the first time.

Excerpts of student work:

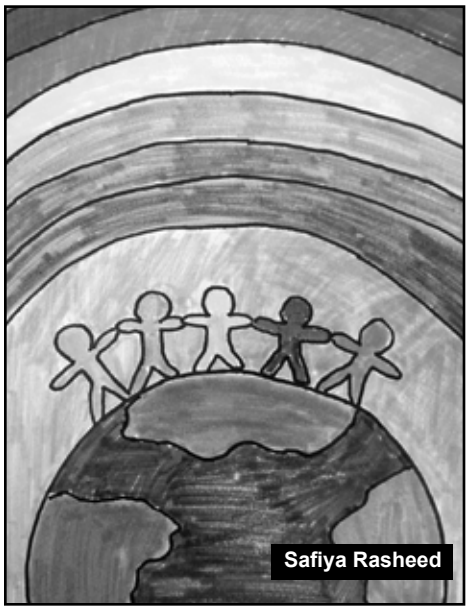
Example 1 - "I held my daughter's hand as we walked toward the beach where the men stood. We dropped our baskets silently and watched as the men bumbled along up the sandy beach. They were larger around than us, with lighter skin and shiny tails on their sides. My daughter looked up at me with fear in her dark eyes. 'Who are they, Mama?...'"

Example 2 – "The ship docked roughly. No one could see through the thick fog. The sound of leaves rustling and animals scurrying through the woods made everything seem more eerie than it actually was. The full moon was our only source of light, even though we could hardly see it through the clouds... We looked around trying to see through the fog, but it was no use, and a contagious scream came from the front of the line..."

By the end of this lesson, students have a clearer understanding of the importance of perspective, and the importance of understanding that there is rarely a single story that encompasses a historical event. Students also have a greater appreciation for the significance of the cultural exchange that occurred between North America and Europe.


Nina Charlier


Matilda Jeffris


Safiya Rasheed

Content: Emancipation Proclamation

Leap Skill: Produce and Consider Many Alternatives

Content Goal: To understand the significance of the Emancipation Proclamation

Creativity Goal: To review and practice divergent and convergent thinking

During a Civil War unit, students read and analyze Lincoln's (1863) Emancipation Proclamation. By this point in our study of the Civil War, students have a strong grasp of the context in which the Emancipation Proclamation emerged, including the role and powers of the President, America's wartime foreign policy, and the divisiveness of African slavery in Antebellum America.

After reading the Emancipation Proclamation, students inquire why—other than prohibiting slavery—Lincoln might have issued the Emancipation Proclamation at this time. After a brief class discussion in which we explore possible reasons, students break into small groups, review rules for divergent thinking (Miller, Vehar, Firestien, Thurber, & Nielsen, 2001), and then brainstorm all possible reasons why Lincoln might have issued this proclamation. After generating hundreds of options, students need to select some of them. Criteria are presented and rules for convergent thinking are emphasized (Miller et al., 2001) to help them decide what they believe to be Lincoln's other motivations for ending slavery.

After reviewing student selections, we compare the answers generated during the class discussion with those generated after diverging and converging. Predictably, we consistently find that generating many and varied options ultimately results in better, more thoughtful answers. Common post-activity responses include the following: to gain foreign allies; to harm the South's economy; to motivate abolitionists to enlist; and to solidify his legacy for posterity.

While we use creativity in this lesson to generate possibilities and options, the goal is not to have novel ideas. The main goal of this lesson is to show the students that they can answer the question correctly by using creativity instead of a textbook. They do not need to find a single, conclusive right answer anywhere—they can discover multiple and various right answers with a little bit of thought and energy.

Conclusion

I still hear educators say, "How do I bring creativity into my classroom?" I start by telling them about a great teacher and researcher, E. Paul Torrance, and his creativity skills. His infectious energy and outstanding research heavily influenced my mentor, Mary Murdock, and she instilled in me the same enthusiasm. Now, I have the great honor to pass the teachings of Torrance onto my students.

By taking small leaps, teachers everywhere can make big changes to bring creative thinking skills into their classrooms. E. Paul Torrance was a great teacher who sparked creative teaching and learning in other educators. By incorporating his skills into lesson plans and passing on his enthusiasm for learning, I recognize my potential to inspire the fourth generation of Torrance teachers each time I walk into my classroom. He left a legacy of work behind him for others to build upon, and I expect to see many more generations to come.

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Amina Schmidt

Teaching Children Creative Thinking and Problem Solving Skills: Strategies for Building Creativity through Classroom Instruction and Interventions

by Stephen T. Schroth

Introduction

Children of any age can be taught creative thinking and problem solving skills (Beghetto, Kaufman, & Baer, 2015; Smutny & von Fremd, 2009; Torrance, 1962; Treffinger, Isaksen, & Stead-Dorval, 2006). Indeed, working directly with children to provide them with explicit and direct instruction on how best to develop, master, and hone their creative thinking and problem solving abilities has long been demonstrated as effective (Torrance & Torrance, 1973). Few teachers, however, feel comfortable working to develop students' creativity (Schroth & Helfer, 2008). Many teachers and parents are thus left with a variety of questions regarding creativity and the children with whom they work. Can anyone teach children creative thinking and problem solving skills? How should I start this process? Are some subjects that are better for teaching creative thinking and problem solving skills than others? Where in my day would teaching creative thinking and problem solving skills best fit? What tools exist that can assist me in beginning this process? What if I work with very young children? Where should I begin?

Fortunately, decades of research provide answers to these questions. Creative thinking and problem solving skills can be taught to any child of any age in any subject (Schroth & Helfer, 2015; Smutny & von Fremd, 2009; Treffinger, Isaksen, & Stead-Doval, 2006). A variety of approaches for teaching creative thinking and problem solving skills exist, and a plethora of tools are available to assist the teacher or parent who seeks to initiate this process with children (Smutny & von Fremd, 2009; Torrance, 1962; Treffinger, Nassab, Schoonover, Selby, Shepardson, Wittig, & Young, 2003; Treffinger, Isaksen, & Stead-Doval, 2006). Indeed, many resources have specifically addressed how to teach creativity while maintaining fidelity to other educational programs that might be in place (Beghetto, Kaufman, & Baer, 2015; Treffinger, Selby, & Schoonover, 2013).

This article explores how creative thinking and problem solving skills might be taught in the classroom, specifically examining what creativity is and how it affects children and their education. It focuses on ways of teaching that incorporate and support the development of creative thinking and problem solving skills including the arts, and strategies for using these tools across age groups and the curriculum. A small selection of crucial resources for those who are interested in teaching creative thinking and problem solving skills is also included. Teachers and parents who wish to teach their children creative thinking and problem solving skills would do well to remember that the most important step they can take is to begin to do so.

Creativity

Although almost universally perceived as advantageous, beneficial, and valuable, no single definition for creativity exists. Creativity has been defined variously, with different perspectives affecting how one understands and experiences the process. Some view creativity as the interplay between desire for preserving important features and qualities of experience and the desire to transform it (Feldman, Csikszentmihalyi, & Gardner, 1994). Others have stressed the importance of novelty and value, emphasizing that, "creativity is the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints)" (Sternberg & Lubart, 1998, p. 3). These definitions are thoughtful and perceptive, demonstrating the necessity for understanding how a field's body of knowledge exists and how it might be improved. When working with children, however, something more is sometimes desired, both to acknowledge children's developing understandings of many disciplines as well as to provide guidance through more concrete activities that teachers can deliver, observe, and assess. Torrance (1962) remedied this need for a more school-friendly definition, describing creativity as, "the process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing these hypotheses; and communicating the results, possibly modifying and retesting the hypotheses" (p. 16). This definition is especially helpful for teachers and others interested in developing children's creative thinking and problem solving because it identifies skills and procedures that can be taught, practiced, and mastered by children as the result of instructional sequences in the classroom.

In the current standards-based environment, children are sometimes viewed solely in terms of their test scores. This is unfortunate, as test scores provide only a partial picture of a child's abilities, struggles, achievements, and talents (Schroth, 2015). Certainly, teachers and parents are responsible for a child's academic progress. However, those who work with children understand that they are just as accountable for student growth in a variety of other competencies, including creative nature, leadership ability, potential in the performing arts, social and emotional wellbeing, moral development, sense of civic responsibility, manners, and citizenship. Teaching creative thinking and problem solving is inexorably linked to an underlying concern for the whole child, and permits teachers and parents the freedom to address each child's skills, talents, and needs (Torrance, 2002; Treffinger, Isaksen, & Stead-Dorval, 2006). Rather than focusing solely on academic performance, effective teachers also concern themselves with how the children think, how they respond to problems, and whether they possess the tenacity and drive to face an especially difficult dilemma (Torrance & Torrance, 1973; Treffinger, Selby, & Schoonover, 2013). Torrance, in his famous Manifesto for Children, perhaps summed up best what this means in practical ways:

1. Don't be afraid to fall in love with something and pursue it with intensity.

2. Know, understand, take pride in, practice, develop, exploit, and enjoy your greatest strengths.

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

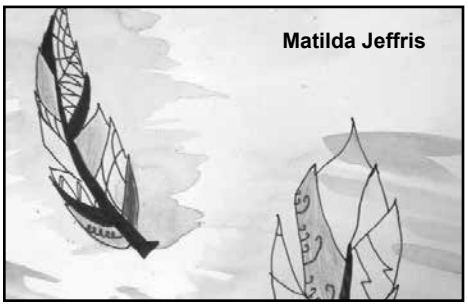
4. Find a great teacher or mentor who will help you.

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

6. Do what you love and can do well.

7. Learn the skills of interdependence.

These suggestions are so important because while they do not teach creative thinking and problem solving skills themselves, they create a learning environment that permits students to thrive and prosper.



While children too often are criticized for "shortcomings" and "deficiencies" exhibited in the classroom, Torrance's Manifesto for Children shifts the focus from problems to passions. Many strategies that develop creative thinking and problem solving skills require children to reflect on what their greatest gifts and deficits might be—a process that aligns perfectly with Torrance's charge to make use of one's greatest strengths and talents (Torrance, 2002). Torrance also suggested that not everyone will cheer their successes or welcome their original thoughts (Torrance, 2002). Many children find this difficult because they have had no constructive school experiences where their ideas meet with resistance. Providing opportunities for their most original concepts to be critiqued by others frees children from these constraints and permits them to develop the tenacity and grit necessary to become adept advocates for their own ideas. Encouraging students to find a great teacher or mentor emboldens them to consider how learning experiences are working for them, and to seek out those who can help them. Discovering what they love and can do well allows children the opportunity to channel their energies into those areas where they might make a difference, rather than building greater competency in areas they do not need (Torrance, 2002). Although it may cause many of the current generation of school reformers palpitations, not all poets need to be proficient in calculus nor must all chemists be adept as painters.

Ways to Teach

Too often, instructional activities take place in the name of "creativity" that have little or nothing to do with the development of creative thinking and problem solving skills (Beghetto, Kaufman, & Baer, 2015; Torrance & Torrance, 1973). Over 40 years ago, Torrance identified nine ways of teaching that effectively build children's creative thinking and problem solving skills. These nine teaching methods consisted of the following:

1. Teaching procedures involving the Creative Problem Solving (CPS) procedures, first developed by Osborn and Parnes;

2. Other disciplined procedures of creative problem solving, such as training in general semantics or creative research methods;

3. Complex programs involving packages of materials designed to build creativity and productive thinking;

4. The creative arts;

5. Reading and media programs designed to teach and provide practice in creative thinking;

6. Curricular and administrative modifications that create favorable conditions for creative thinking and problem solving skills;

7. Teacher-classroom variables, direct and indirect control, classroom environment, and the like;

8. Motivation, rewards, incentives, cooperation, competition, and the like; and

9. Testing conditions designed to facilitate a higher level of cognitive functioning or more valid and reliable test performances (Torrance & Torrance, 1973).

These ways of teaching provide both new and experienced teachers with proven ways of building children's critical thinking and problem solving skills. They are especially useful for those novices who may want to begin incorporating them into their curriculum, or those who are seeking to integrate creative thinking and problem solving skills instruction with other subject matter.

The CPS procedures, which will be covered in greater depth, provide a systematic approach to teaching creative thinking and problem solving skills, and rapidly improve children's ability to look at a problem and to think about it in a more organized and productive fashion. Other disciplined procedures such as training in general semantics or creative research methods, which have students dramatize passages they have read, build both reading comprehension and creative thinking skills. Complex programs involving packages of materials designed to enhance creativity and productive thinking build upon children's verbal and figural fluency, flexibility, originality, and elaboration by asking them to interact with scenarios so that they substitute their actions for those of historical figures. The creative arts, explored in more detail later, can also be used as a vehicle for developing curricula that capitalize upon creative positives, such as emotional expressiveness, enjoyment, and articulateness in role playing and storytelling. Reading and media programs designed to teach creative thinking, such as the Junior Great Books program, stimulate creative writing and thought through systematic use of a set of strategies for attacking unfamiliar text.

Curricular and administrative modifications that create favorable conditions for creative thinking and problem solving include independent study, open classrooms, and other curricular reforms where teachers can provide child-centered instruction tailored to individual needs. Certain teacher-classroom variables, such as direct and indirect control, classroom environment, and the like, can increase the time devoted to the teaching of creativity and student growth, especially if a jointly-developed structure is used where children are provided opportunities to explore ideas they initiated. Motivation, rewards, incentives, cooperation, competition, and the like have been seen as producing short-term results vis-à-vis increased student creative thinking and problem solving skills, but such gains are undependable and reliant upon applying the motivational factors each time the process is undertaken.

These teaching methods can be used in any classroom, with any age level, and for any subject. For school leaders interested in adjusting their learning environment to better accommodate the teaching of creative thinking and problem solving skills, a variety of configurations exist that might be helpful to consider. These program models permit instruction to be configured so that teaching moves away from the traditional one-size-fits-all whole class approach that remains the predominant style (Schroth, 2014). Renzulli and Reis created the Schoolwide Enrichment Model (SEM) in an effort to develop the talents of all students within a single building (Renzulli & Reis, 2014; Schroth, Collins, & Treffinger, 2011). SEM may be used to provide all children with enriched learning experiences and higher learning standards through three goals. These goals are developing talents in all children, providing a broad range of advanced-level enrichment experiences for all students, and providing advanced follow-up opportunities for young people based on their strengths and interests.

The Levels of Service approach focuses on developing all children's talent—the potential for significant contributions (in original or creative ways) in any domain of inquiry, expression, or action, over an extended period of time—and is so vital for survival and success in the 21st Century (Schroth, 2013; Treffinger, Young, Nassab, & Wittig, 2004). Using the talents and efforts of parents, teachers, administrators, specialists, and other members of the general public, the Levels of Service approach tailors services to meet each child's skills, talents, and needs (Schroth, Collins, & Treffinger, 2011; Treffinger, Young, Nassab, & Wittig, 2004).

The Autonomous Learner Model (ALM) also provides a vehicle through which students may work to build their creative thinking and problem solving skills (Betts, 2006; Betts & Kercher, 1999). Based upon the concept that children work best when pursuing those interests in which they are passionately involved, the ALM permits different children to work on different tasks (Betts, 2004; Betts, Toy, & Vasquez, 2006). Teachers who plan to provide most creative thinking and problem solving skills themselves would do well to review various means of differentiating instruction (Smutny & von Fremd, 2010; Tomlinson, 2003). Using student readiness levels, interests, and learning profiles, differentiated instruction permits teachers to meet students' needs in ways that provide an appropriate level of challenge for all (Schroth, Helfer, Beck, & Swanson, 2011; Tomlinson, 2014). By thinking about how the teaching of creative thinking and problem solving skills might fit within the day, teachers assure that such instruction occurs. No single program model will work best for all schools, classrooms, or children. Each administrator, teacher, and parent must consider the unique resources and needs facing him or her and make the best decision possible for the children served (Schroth, 2014).

Creative Problem Solving (CPS) and the Creative Arts

Two methods of teaching Torrance found useful for building children's creative thinking and problem solving skills were CPS and the creative arts. Each of these is an attractive entry point for the novice teacher, as a wealth of materials have been developed for creative thinking and problem solving skills to be taught in a manner to optimize student growth (Torrance, 1962; Torrance & Torrance, 1973). Both CPS and the creative arts are also intellectually rigorous and nuanced, permitting even the most seasoned veteran opportunities to craft novel, innovative, and appropriate instructional experiences for children (Schroth & Helfer, 2011; Smutny & von Fremd, 2009; Treffinger, Isaksen & Stead-Dorval, 2006). Using one of these teaching methods to introduce creative thinking and problem solving skills, and then to build upon these competencies, allows children the opportunity to develop these abilities (Torrance & Torrance, 1973). The rich and comprehensive resources available for each of these ways are also helpful, as they provide teachers wanting to improve their practice ample examples and materials to do so.

Creative Problem Solving

First developed during the 1950s by Parnes and Osborne, CPS is a proven way of building the creative thinking and problem solving skills of learners of any age (Osborn, 1963; Parnes, 1967; Treffinger, Isaksen, & Stead-Dorval, 2006). CPS is a flexible and dynamic process (Treffinger, Isaksen, & Stead-Dorval, 2006; Treffinger, Selby, & Schoonover, 2013). Those using the process can begin at any point and may revisit those parts as necessary (Schroth et al., 2011; Treffinger, Isaksen, & Stead-Dorval, 2006). CPS consists of four main components and eight specific stages, which may be used in unison or individually (Treffinger, Isaksen, & Stead-Dorval, 2006). The components consist of Understanding the Challenge, Generating Ideas, Preparing for Action, and Planning Your Approach (Treffinger, Isaksen, & Stead-Dorval, 2006). The specific stages are framing problems, exploring data, constructing opportunities, generating ideas, developing solutions, building acceptance, appraising tasks, and designing process (Treffinger, Isakesen, & Stead-Dorval, 2006). A variety of tools exist to help with each of the stages, such as brainstorming, SCAMPER (i.e., substitute, combine, adapt, modify, put to another use, eliminate, and reverse), ALoU (i.e., advantages, limitations, overcome limitations, and unique features), and many others (Treffinger & Nassab, 2000).

CPS can be used with students of any age, with any subject, and at any time (Schroth et al., 2011; Treffinger, Isaksen, & Stead-Dorval, 2006). A third grade teacher, for example, who is exploring continuity and change with her students may use a variety of CPS strategies and tools as part of that process (California Department of Education, 1998). If her overarching goal is for students to demonstrate basic economic reasoning skills and an understanding of the economy of the local region, she might suggest the children work in groups to develop a product using local resources with appeal to consumers in the area. To begin this process, the children engage in a brainstorming exercise, focusing on generating as many products as possible, welcoming unusual options, withholding criticism from ideas generated, and combining ideas to create new options (Treffinger & Nassab, 2000; Treffinger, Selby, & Schoonover, 2013). Once a list of possible products is generated, the students could use SCAMPER to hone and improve some of the popular ideas, this time engaging in a more critical approach (Treffinger, Isaksen, & Stead-Dorval, 2006; Treffinger & Nassab, 2000). Finally, when one or two of the potential products are selected as most popular, the children might use ALoU to analyze each and to determine the one to use for producing a prototype (Schroth, Collins, & Treffinger, 2011; Treffinger & Nassab, 2000).

The Creative Arts

The creative arts can be used in various ways to build children's creative thinking and problem solving skills (Torrance & Torrance, 1973). In some cases, the curriculum of a classroom or a school may be based upon the creative arts, with multiple opportunities for children to engage in creative writing, dance, music, theatre, and the visual arts (Schroth, Helfer, Gonshorek, Lanfair, Mahone, & Rudd, 2011). In other situations, the creative arts may be limited to after-school extracurricular activities, summer programs, or single class experiences (Schroth, 2007). Using the creative arts as part of the curriculum benefits students in several ways (Schroth, Helfer, Gonshorek, Lanfair, Mahone, & Rudd, 2011; Torrance & Torrance, 1973). First, it enhances children's enjoyment of and ability in creative writing, dance, music, theatre, and the visual arts (Gardner, 2006). Second, it permits children to engage in emotional expressiveness, which is especially important for those from low socioeconomic status (SES) backgrounds (Torrance & Torrance, 1973). Third, the arts expose children to the process of creativity, allowing them to study exemplars who have produced work of lasting merit (Gardner, 2006; Torrance, 1962). Fourth, exposure to the creative arts builds children's sense of narrative and the importance of storytelling as a means of communicating with others (Torrance & Torrance, 1973). Finally, the arts generate an appreciation of and proficiency in problem solving skills, insofar that creation involves determining a theme and executing this so others may understand or engage with it (Schroth, Helfer, Gonshorek, Lanfair, Mahone, & Rudd, 2011; Torrance & Torrance, 1973). The creative arts can be used in conjunction with other programs, such as CPS, or alone (Torrance, 1962; Treffinger, Isaksen, & Stead-Dorval, 2006).

In the classroom, the creative arts may be used by teachers to build children's understandings of other disciplines or as stand-alone activities (Torrance & Torrance, 1973). A first-grade teacher, for example, may ask his students to compare and contrast everyday life in different times and places around the world, recognizing some aspects of people, places, and things change over time while others stay the same (California Department of Education, 1998). When he asks the students to recognize similarities and differences between children of earlier generations and today in such areas as work (inside and outside the home), dress, manners, stories, games, and festivals, drawing from biographies, oral histories, and folklore he might use paintings and other artworks for children to make these comparisons. Such representations are obviously available from a variety of sources. Art galleries such as the J. Paul Getty Museum have searchable collections available online that may be used by teachers without cost as part of their Open Content Program (OCP). After individual students or small groups download and print images of children from various points in history, the teacher might demonstrate how to use a Venn diagram to determine similarities and differences between the various representations from long ago and children who live in the present day. The students might then use the representations gathered to create museum exhibits that explore and explain the similarities and differences between children today and long ago.

Conclusion

Torrance left us a tremendous legacy of advocating for children, showing the importance to their development of teaching creative thinking and problem solving skills (Torrance, 1962; 2002). His emphasis upon the learning, well-being, and success of children was his most important goal (Torrance, 2002; Torrance & Torrance, 1973). This concern for the whole child undergirds his emphasis on instruction in creative thinking and problem solving skills for all children (Torrance, 1962; 2002). Building instructional experiences permitting children to engage with activities that support and explore creativity is one way to honor Torrance's legacy, allowing all children to develop the creative thinking and problem solving skills necessary for success. As the pressures upon classroom teachers to adhere to standards and assessment schedules become ever more intense, teaching children creative thinking and problem solving skills become even more important for success in the 21st century. Using lessons that build children's creative thinking and problem solving skills on a daily basis is one of the finest ways we can honor Torrance and his many contributions.

Resources for Teaching Creative Thinking and Problem Solving Skills

The J. Paul Getty Museum Collection
http://www.getty.edu/art/collection/
Open Content Program permits teachers, parents, and students to locate, download, and use drawings, paintings, and other artworks from the Getty collection

Igniting Creativity in Gifted Learners, K-6: Strategies for Every Teacher
Joan Franklin Smutny and S. E. von Fremd
Tremendous sourcebook that provides ideas for developing creativity in young learners

Creative Problem Solving: An Introduction (4th ed.)
Donald J. Treffinger, Scott G. Isaksen, & K. Brian Stead-Dorval
An explanation of and toolkit for using the Creative Problem Solving approach with students of any age

The Differentiated Classroom: Responding to the Needs of All Learners (2nd ed.)
Carol Ann Tomlinson
Wonderful introduction to differentiated instruction

Torrance Creativity Awards
http://www.centerforgifted.org/torrance.html
International competition celebrating student excellence in creative writing, the visual arts, music, and inventions

Planning Differentiated Instruction & Assessing Results: Teaching to Assure Each Student's Success
Stephen T. Schroth, Jason A. Helfer, Diana L. Beck, & Barry L. Swanson
Introduction to planning instruction to assure student growth in mixed-ability classrooms

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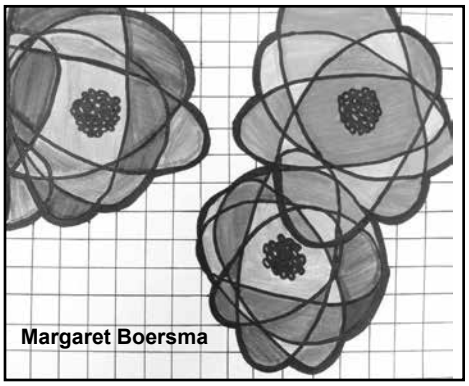

Margaret Boersma

Academic Creativity in Your Classroom

Kathryn Haydon, Kathy Goff, and Jane Harvey

Introduction

E. Paul Torrance wrote, ". . . the intuitive, creative thinking processes represent mankind's highest thinking ability" (Torrance and Safter, 1990, p. 7). His work began with this premise and, over more than six decades, he found quantitative and experiential proof of its validity. In 2002, Bloom's Taxonomy caught up with Torrance's forward thinking and was revised, placing creativity at the pinnacle as the most complex cognitive process (Krathwohl, 2002).

One of the discussions Torrance pioneered explores the concept of academic creativity (Torrance & Goff, 1990). In school, the myth persists that creativity lives in the art, music, and theater rooms or as a "hands-on activity" thrown in now and again. Creativity is thought to be an adjunct to the core curriculum. Torrance sought to debunk this myth and to demonstrate creativity as necessary, natural, and integral to any academic program. Since creativity is the highest form of thinking, our students should have the opportunity to engage in this higher-level thinking daily and throughout their schooling. Only then do they have the best potential for learning and growth opportunities.

Torrance defined 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 guesses and hypotheses; possibly revising and retesting them and finally communicating the results" (Torrance, 1988, p. 47). These processes may sound very familiar to you. Some focus on the scientific method and some emphasize creativity as simply thinking, or more specifically, problem solving. Aren't thinking and problem solving the reason for school and learning in the first place, especially these days when knowledge has become a greater commodity than ever?

Unfortunately, much learning that transpires, especially under systems of standardization and testing, is far from creative (Beghetto, 2010; Richards, 2010; Torrance, 1959; Wallach & Kogan, 1965). Torrance's work, perhaps ahead of its time when first introduced, provides easy roadmaps to guide us in the direction of academic creativity, which can also be defined as creative learning.

What is Creative Learning?

Creative learning is a paradigm for teaching and learning that calls upon the creative thinking skills of students as they engage in core academic subjects. Torrance (1979), in his work on developing his Incubation Model of Teaching, identified 18 creative thinking skills that underlie creativity. The following list is a simple summary of these skills: imagining, experimenting, discovering, elaborating, testing solutions, and communicating discoveries. While Torrance highlighted these dimensions of learning in the 1970's, you will recognize them as foundational to what we now call the 21st century skills: creativity, critical thinking, problem solving, communication, and collaboration (Partnership for 21st Century Skills, 2015).

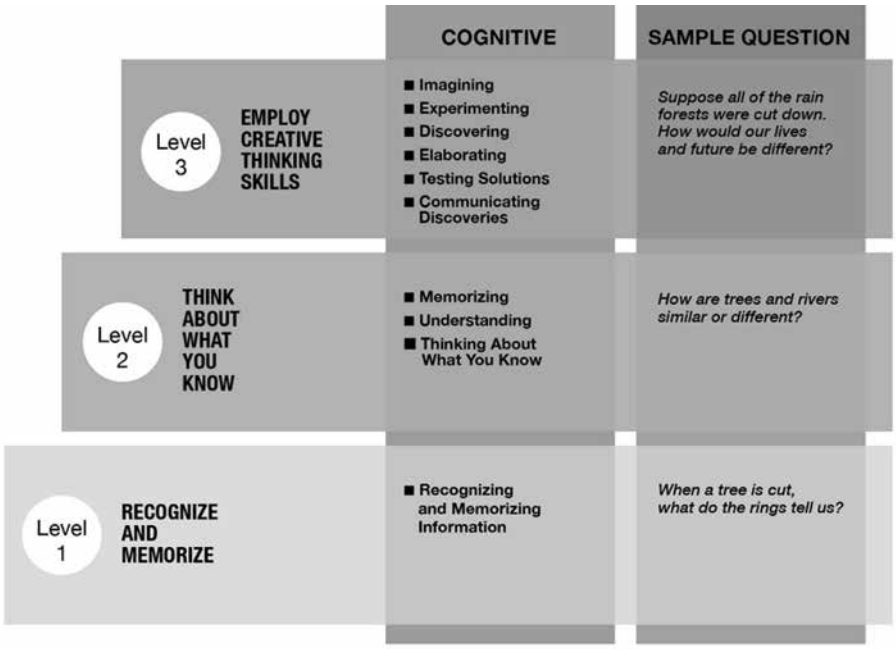
Over the years, a body of literature has grown around the topic of creative learning. This research emerged in the fields of gifted education, creativity, and psychology, and crosses international borders. Researchers and practitioners in the United Kingdom have worked to summarily define the paradigm (Craft, Cremin, Burnard, & Chappell, 2007; Jeffrey & Craft, 2004). Studying this work, we arrive at four central tenets of a creative learning paradigm:

- **creativity is integrated with academic content teaching and learning, which causes**
- **learning to be meaningful to students and**
- **drives their motivation intrinsically,**
- **resulting in new ideas, skills, or personal growth (Haydon, 2015; Jeffrey, 2006).**

Why is creative learning important? Scottish researchers recently undertook a literature review of several hundred articles to find out what the research says. "Empirical studies included in the review demonstrated that creative learning led to improved academic achievement; increased confidence and resilience; enhanced motivation and engagement; development of social, emotional and thinking skills; and improved school attendance" (Davies, Jindal-Snape, Collier, Digby, Hay, & Howe, 2013; Haydon, 2015). On review, creative learning seems to solve many of the problems that we face in our schools. So, how do we achieve it? In their original 1990 article, Torrance and Goff provided an easy pathway for teachers. Here, we update and expand on this approach for easy implementation, even under the stresses and pressures that exist for today's teachers.

Level Three Learning in the Classroom

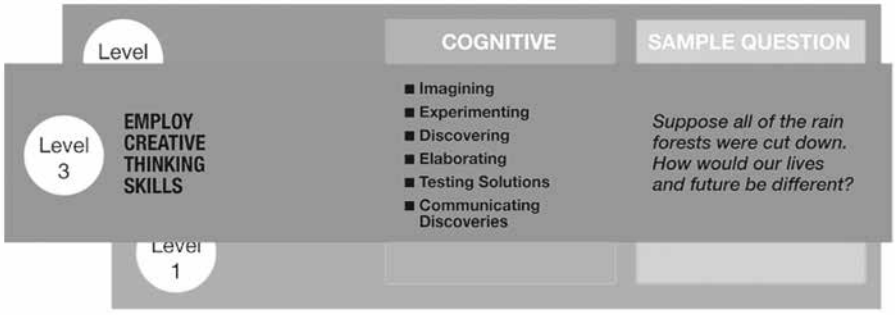
In 1990, Torrance and Goff wrote, "Wise teachers offer a curriculum with plenty of opportunities for creative behaviors. They can make assignments that call for original work, independent learning, self-initiated projects, and experimentation" (ERIC No. ED321489). But how to do this when there's a set curriculum, standards to meet, and days upon days of testing? The good news is that even within the confines of a predetermined program, teachers can ignite creative learning by tweaking the questions they ask.



Torrance Learning Model

Adapted from: Torrance, E. P. & Goff, K. (1990). *Fostering academic creativity in gifted students.* (ERIC Digest No. E484). Retrieved from ERIC database. (ED321489)

Please refer to the chart entitled Torrance Learning Model. The goal of creative learning is to replace Level 1 questions that require only recognition and memorization with Level 3 questions. Level 3 questions ask students to imagine, experiment with ideas, discover, elaborate, test their ideas within context, and communicate their discoveries. The goal is not to start with Level 1 and move in progression up the ladder. Level 2 is included to clarify that a compare and contrast question of this nature is still not a Level 3 question such as you see here. The ideal chart, instead, looks like the abridged Torrance Learning Model chart pictured, showing the preferred pathway: Level 3 usurps Levels 1 and 2.



Torrance Learning Model

Adapted from: Torrance, E. P. & Goff, K. (1990). *Fostering academic creativity in gifted students.* (ERIC Digest No. E484). Retrieved from ERIC database. (ED321489)

Higher-Level Questions as a Starting Point

There is a common myth that students are incapable of working with higher level questions before they "master the facts." This is simply not true. In reality, sometimes compulsory rote mastery of the facts does more damage than good. Consider early elementary math, for example. Curriculum traditionally requires students to complete hundreds of problems to essentially automate their facts before they apply the operations to real life situations.

While we agree that quick recall is important to develop and experience, the research (Mayer, 2002) shows that if we give students creative thinking and learning questions —opportunities to apply and explore the concepts— they will achieve this mastery over time. When they learn the operational skills, they will do so meaningfully and deeply, because they will incorporate the learning into their knowledge base and practical experience. Some students (especially highly creative students) simply cannot learn by memorizing what feels meaningless to them. Requiring them to memorize first and apply creative thinking later may backfire as they are already disillusioned with the subject and their inability to engage and progress (Sawyer, 2006). Therefore, beginning with Level 3 serves the purpose of learning on several levels.

Teacher-Generated Examples Across Content Areas

LANGUAGE ARTS **Instead of asking:** When do we use a period and when do we use a question mark? Define a plural noun.	**Ask:** What would happen if all of the punctuation marks suddenly disappeared? In what ways would we have to write differently if we didn't have plural nouns?
SCIENCE **Instead of asking**: What do all organisms need to live and grow? Draw a food web for a desert biome.	**Ask:** What are all the ways organisms are helped or threatened by our increasing global population? Draw a food web for a desert biome. Now imagine that the large predators became extinct. Draw or write about the effects of this change.
MATH **Instead of asking:** What is the formula needed to find the area of a room? Draw the fraction 1/2.	**Ask:** What are all the ways you can think of to design floor covering for a 12x15 room. Pick a few of your favorites and provide instructions (written or illustrated) to carry out your plan. What might be all of the ways to cut a rectangular cake so that you and your friend each get the same amount?
SOCIAL STUDIES **Instead of asking:** What are the 3 branches of government? Who invented electricity?	**Ask:** How might our government be affected if there were only 2 of the 3 branches of government? In what ways did the invention of electricity change the way people lived?

In our experience, teachers enjoy creating Level 3 questions for their students. As they apply their own creativity and deep thinking to transform Level 1 questions into Level 3 questions, they see how their students are engaged and learning deeply as they bring their own, original thinking to the table. Please refer to the accompanying chart, which is filled with examples of Level 3 questions developed by real teachers across the content areas.

How to Write Your Own

Chances are that the teacher examples provided have inspired some new questions in your own mind. On the other hand, you may need a tool to help you move into the mindset of generating Level 3 questions. Try using this sentence starter: "What might be all of the ways/ideas/outcomes/solutions . . . ?" (Miller, Vehar, Firestien, Thurber, & Nielsen, 2011, p. 63). Take a look at one of the math examples. We went from a Level 1 question, "How do you draw the fraction 1/2?" to "What might be all of the ways to cut a rectangular cake so that you and your friend each have an equal amount?" That simple tweak to the words and call for more than one answer cracks open the question to invite multiple possibilities. There are still correct answers, but students are invited to explore and experiment to get there. If you can't think of a Level 3 question for a particular topic, try brainstorming a list of questions using the "What might be all of the ways . . ." sentence starter as a catalyst. Give yourself time to come up with many ideas. Then, use your learning goals, target skills for a particular lesson, and your students' interests to choose from the ideas you generated.

Level 3 Supports: Divergent Thinking Guidelines

The suggestion in the prior paragraph to separate your ideas from their evaluation and selection leads to a discussion of key elements of classroom culture that support creative learning and successful Level 3 questioning. It is important to

keep a climate of openness to student ideas with trust among students and teacher, as well as support for individual strengths. If your students have been raised on a diet of Level 1 questions through the years, it may take a little re-training for them to delve into Level 3, and to understand that yes, you really do want their original ideas and no, there is not one right answer. If you encounter resistance, it is likely because they are conditioned to complete the requirements to get a good grade rather than pursue original thoughts and explorations. Sometimes creative learning requires as much growth on the teacher's part as it does the students'. All must learn to trust and value each other.

To set the stage for this new paradigm, when you introduce a Level 3 question, be sure to introduce the divergent thinking ground rules at the same time. You might make a poster to hang in the classroom to remind students as they engage in original thinking and exploration:

During divergent thinking,

i. Keep all ideas that come to you; don't pre-judge them.

ii. Think of as many ideas as you can.

iii. Combine and build on ideas.

iv. Look for wacky and wild ideas (Miller et al., 2011; Osborn, 1953).

Oftentimes, students will get stuck if they feel that they need to generate ideas as they write them into their response or essay. It is natural that they would get stuck, because in creative thinking there are two distinct processes: divergent thinking (generating ideas) and convergent thinking (choosing the best and most appropriate idea to answer the question). To be successful, we must take the time (even a few minutes) to separate these mental actions. You will recognize convergent thinking as critical, analytical thinking. Students must evaluate their ideas to meet the requirements of the assignment. So, you can see that creative learning is indeed the highest level of thinking, as it requires not only analysis, but divergent thinking skills that encourage real, meaningful growth for students.

Creative thinking and learning involve such abilities as evaluation, redefinition, analysis, different production, and problem solving abilities. Creative learning is a natural, healthy human process that occurs when students become curious or excited about understanding or discovering more.

A Final Word: How Teachers Can Encourage Creativity

We have written much about what to do, but let's end by communicating four things that adults should bear in mind in order to avoid sabotaging their efforts to bring creative learning into the classroom:

1. Insisting that children do things the "right way" does not encourage children to think any further. This requires a teacher to stay open to other ways to do something, and to allow experimentation in order for students to discover on their own that there may indeed be one best right way.

2. When we label a child's flights of fantasy as "silly," we bring the child down to earth with a thud, causing the inventive urge to curl up and die. Children learn to be realistic by using their imaginations. Through play, they learn to collaborate and identify strengths .

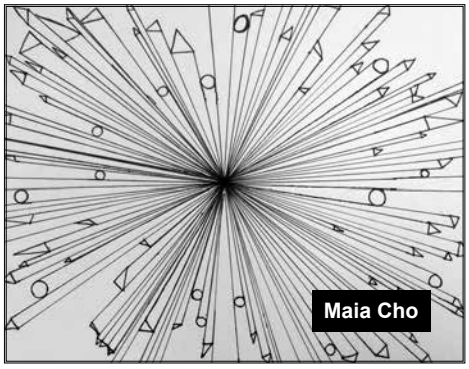
3. Children cannot really be compared. Subtle pressure on a child to conform inhibits individual freedom and the opportunity to be authentic.

4. One of the surest indicators of creativity is curiosity; yet we often brush questions aside because we are too busy for "silly" questions. Children's questions deserve respect. The message sent when a question is ignored is that you should not ask questions, not that you are too busy.

Conclusion

The good news is that even if you start with small steps, using the divergent thinking rules and Level 3 questions as guideposts, you will be on your way to deeper student engagement and learning, as well as teaching inspiration for yourself. In an era focused on standardization, teachers who encourage creative learning are going against the grain even as they prepare students to use the powerful thinking skills they need to succeed in their lives beyond school. These teachers need courage, camaraderie, and support from parents. More tests, structure, and keeping every student on the same page at the same time will not develop the problem solvers that we need. Raising generations of students who are taught to find the right answer has finally caught up with us. Businesses and industry are identifying creativity as the most sought-out characteristic for a competitive edge (IBM, 2010), and human resource departments are being asked to find creative candidates. All around us creativity is needed with no ready supply of candidates. In addition, democracy is founded on the individual's right and ability to contribute his own voice. What do we have to contribute if we are not enabled to understand how and what we think?

Creative learning involves learning as much about yourself as it does the subject. If the environment is supportive, we share our personal thoughts and learn from others' perspectives and ideas. Using Level 3 questions creates that very environment by encouraging deep student engagement, rigorous but inspired academic learning, and the lifelong ability to problem solve.



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II. Creative Intelligence: Fostering Its Growth and Development

Inspiring Creativity in Teachers to Impact Students

by Ellen Honeck

Creativity has become more present in popular literature. Spending a few minutes on social media, it is easy to view references to creativity whether it be DIY (do it yourself) projects, research based articles, business products, process innovations or stories of everyday creativity. The importance of creativity has gained recognition as society becomes more global.

Society is evolving and tools are being utilized that were not in existence a few years ago. Innovation is at the forefront of business, entertainment, and social action efforts. It is critical that educators keep up with these changes and realize that the skills essential for future careers may be totally different than current ones. Teachers and schools are preparing students for jobs that don't exist yet—making creative thinking skills and creativity critical in current education.

The Partnership for 21st Century Skills (www.21stcenturyskills.org), a combination of stakeholders representing businesses and education, includes the need for Creativity and Innovation. One aspect of the 21st century student outcomes is Learning and Innovation Skills that focus on Critical Thinking, Communication, Collaboration, and Creativity. The importance of these skills is to think creatively, work creatively with others, and implement innovations.

As we look to education to help students understand and learn these skills, we must define creativity. It is important to have a sense of consistency when discussing creativity, the characteristics of creative individuals, and creative thinking skills, so there is an understanding of the purpose for including these skills in the curriculum.

Defining Creativity

Creativity research has various schools of thought in terms of defining and understanding the constructs. There are several theories and models related to creativity and the incorporation of these into education. These models reflect various schools of thought. As examined by Alane Starko (2010, p. 46-74), they have evolved within distinct fields:

1. Psychoanalytic theories
(Sigmund Freud; Ernst Kris; Lawrence Kubie; Carl Jung)

2. Behaviorist, humanist and developmentalist theories
(Abraham Maslow; Erik Erikson; Lev Vygotsky)

3. Creativity, intelligence and cognition
(Joy P. Guilford; Robert Sternberg; Howard Gardner)

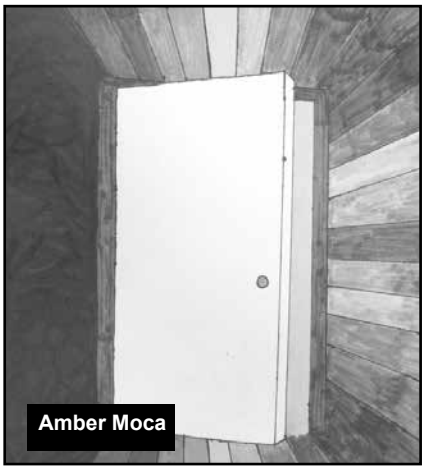
4. Creative process theories
(E. Paul Torrance; John Dewey & Graham Wallas; Donald Treffinger; Joseph Renzulli; Jane Piirto; Sid Parnes & Alex Osborn; David Feldman; Mihaly Csikszentmihalyi; Dean K. Simonton).

The various models and definitions of creativity continue to be topics of discussion and research. The recognition that there are many components to creativity and that these manifestations can look different in individuals has led to the discovery of characteristics and tools of creative thinking. Understanding the positive and negative characteristics of creativity is beneficial for teachers as they develop their own skills and look to imbed opportunities for students in current curriculum practice.

Characteristics of Creative Individuals

Regardless of the creativity model, numerous studies have identified characteristics of creative individuals. These characteristics lie on a continuum and can be domain specific. This continuum, ranging from positive to negative manifestations, was identified by Bonnie Crammond (2005, p. 8-9) and includes a variety of these behaviors.

Open to Ideas	*Fails to Finish*
Curious	*Nosy*
Risk Taking	*Thrill Seeking*
Spontaneous	*Impulsive*
Strong Self-Concept	*Arrogant/Conceited*
Persistent	*Stubborn*
Courageous	*Unaware of Consequences*
High Energy	*Hyperactive*
Reflective	*Daydreaming*
Independent	*Isolated*



Amber Moca

Within these characteristics are several areas with potential pitfalls. Creativity may also be hidden in those that appear not very creative (Crammond, 2005). Since the characteristics exist on a continuum, they may appear at different times in one's life and development impacts their display. In adulthood it is "easier" to focus high energy on the creative outlet or project that is often necessary to achieve within the domain. "Torrance (1982) found in his longitudinal study of creative individuals that having a mentor was critical to children's ability to retain their creativity" (Crammond, 2005, p. 10).

When evaluating these multiple characteristics along the continuum, the question becomes, can creativity be taught? There are two ways to think about teaching creativity. The first involves teaching the generic skills of creative thinking and the second is to identify the personal aptitude and passion of the students and foster the connection within that domain. Teachers should focus on the process aspect instead of the product. The process of creativity and the skills identified within the process are critical for the students to become productive in the 21st century. These skills include the "f" word – failure. Failure should be "viewed as an opportunity to learn; understanding that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes" (www.21stcenturyskills.org).

Teachers need to focus on the development of creativity in their students. Treffinger, Young, Selbey, and Shepardson (2002) state, "Many of these characteristics can be taught and nurtured. As a result, it is difficult to predict which students may become creatively productive adults" (p. viii). When focusing on the classroom and activities with this lens, the development and inclusion of creative thinking skills becomes more practical and not as encompassing. It is vital to recognize the importance of these skills and then select the appropriate activities, demonstrations, materials, curriculum and instructional delivery methods to foster their development.

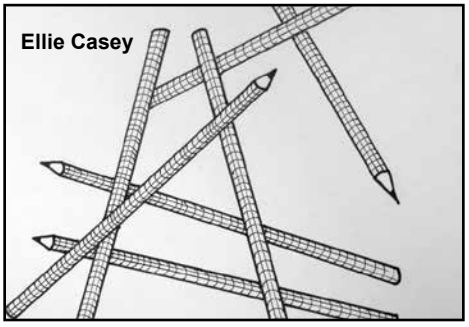
Torrance developed a model for studying and predicating creative behavior. His model focuses on the elements of creative abilities, creative skills and creative motivations (Torrance, 1979). "The nature of creativity and societal attitudes concerning it are such that there may be at times little or no relationship between creative abilities and the motivations and skills necessary to activate these abilities and result in "satori" and creative accomplishment" (p. 13). It is the overlap of all three of these elements that lead to creative behavior. In order to encourage teachers to teach and foster creative behavior, it is important for them to understand and foster their own creative behavior.

Tools of Creative Thinking

Torrance (1979) introduced four skills of creativity that enable creative behavior. These skills can be learned and practiced by everyone regardless of age. The four skills are Fluency, Flexibility, Originality and Elaboration. As individuals develop creatively these skills foster the development of ideas.

- **Fluency-** is the generation of many ideas during the creative process
- **Flexibility –** generation of different types of ideas and categories
- **Originality –** the uniqueness of the idea
- **Elaboration –** the addition of detail

These four foundational skills are critical to understand and foster the development of creativity. Strategies and creative thinking tools stimulate individual growth across these areas. Tools and strategies tie back into these four overarching skills.



Root-Bernstein and Root-Bernstein (1999) identified "13 thinking tools" at the heart of creative understanding. These thinking tools consist of the following:

1. Observing (Paying attention to what is seen, heard, touched, smelled, tasted or felt within the body) (p. 25)

2. Imagining (Ability to recall or imagine these feelings and sensations) (p. 25)

3. Abstracting (Sense experience and sense imagery are rich and complex - process of paring down complicated things to simple principles) (p. 25)

4. Recognizing patterns (Discovery of nature's laws and the structure of math) (p. 25)

5. Pattern forming (Always begins with combining simple elements in unexpected ways) (p. 25)

6. Analogizing (Recognizing patterns in patterns) (p. 25)

7. Body thinking (Thinking that occurs through the sensations and awareness of muscle, sinew and skin) (p. 25)

8. Empathizing (Related to body thinking—"losing" themselves in things they study) (pp. 25-26)

9. Dimensional thinking (Imaginative ability to take a thing mentally from a flat plane into three dimensions or more, from earth into outer space, through time, even to alternate worlds) (p. 26)

10. Modeling (Objects and concepts often require some combination of dimensional thinking, abstracting, analogizing and manipulative or body skill) (p. 26)

11. Playing (Particularly builds upon body thinking, empathizing, and play acting and modeling – childlike joy) (p. 26)

12. Transforming (The process of translating between one tool for thinking and another, and between imaginative tools and formal languages of communication) (p. 26)

13. Synthesizing (Understanding is always synthetic, combining many kinds of experiences – an integration of knowledge in which observing, imagining, empathizing, and the other tools all work together organically not serially) (p. 27)

These tools provide guidelines to foster creative thinking. While there is not a guideline on how to teach these skills there is recognition of the importance of these elements. Understanding and analyzing how these relate to the four skills of fluency, flexibility, originality, and elaboration provide depth in the generation of classroom activities to foster their development.

Environment that supports creativity

The classroom environment is critical in all aspects of learning. The two key elements of psychological safety and intrinsic motivation are important elements that must be included for the environment to support creativity.

Starko (2010) states that psychological safety includes unconditional acceptance with the understanding that while not all behaviors are acceptable, there are clear rules and consequences: lack of external evaluation, empathetic understanding, the creation and enactment of a creative group atmosphere, prevention and avoidance of negative sanctions with a celebration of new ideas or thoughts, avoidance of group pressure and competition, and rewarding creative thinking and output. Teachers need to create an environment where their students can embrace creativity and the school/administration also needs to establish the same type of environment for their teachers.

Klaus Urban (2007) developed 25 recommendations for stimulating and nurturing creativity in school. Many of these recommendations have to do with the psychological safety of the classroom. Some of these recommendations include "avoiding group pressure and envy of competition" as well as "negative reactions or sanctions by classmates," "demonstrating and appreciating humor," "support[ing] self-initiated questioning and learning," "provok[ing] and provid[ing] for situations by challenging, stimulating and requiring creative behavior," "allowing errors and mistakes," "support[ing] interests as well as perception and acquisition of knowledge," and "develop[ing] and demonstrat[ing] constructive criticism, not just criticism." There are many ways to create an environment that is psychologically safe for creative expression and developing creativity.

Formulating statements that stimulate or provoke questions by students, allowing errors and mistakes, providing opportunities to pursue personal interests and passions, and fostering quiet reflection, exploration of materials and ideas, and stimulation can foster intrinsic motivation. Research by Amabile (1996) shows that, "Intrinsic motivation is conducive to creativity; controlling extrinsic motivation is detrimental to creativity, but information or enabling extrinsic motivation can be conducive particularly if initial levels of intrinsic motivation are high (p. 119)" (as cited in Starko, 2010, p. 248). Developing a classroom environment that is focused on minimizing creativity killers and fostering the internal motivation of students is key.

Many of the recommendations for a creative classroom should be in place for a safe learning environment. The awareness and focus on creativity will impact the environment as well as the teachers and students within that environment. Recognition of creativity killers is important when focusing on the environment. For example, the use of external awards limits creativity in the classroom.

Creativity Blocks/Killers

Creativity can be fostered through the use of coaching or critiquing. The art of educational criticism can be utilized when evaluating creativity in the classroom. "The critic (in this case the teacher) needs to perceive what is subtle and complex, must appreciate the … meaning of events, and must be able to make those meanings vivid through the language he or she uses to communicate" (Eisner, 2002, p 57). This critique helps the student push past the requirements and make meaning of the assignments. Research has identified many blocks or killers to creativity. These blocks involve a variety of aspects related to classroom practice including grades. When students are focused on grades, this critique becomes irrelevant. These practices


Isabelle Gawedzki

accept various methods of output while ensuring the content is being represented. With grading on their minds, many students will not push themselves past the requirements. Projects will not be as creative because it is generally easier to do something within the scope of the requirements rather than push boundaries.

Teachers should provide students instruction and opportunities to utilize the skills for creative thinking. Without these skills students will be unable to generate the ideas necessary to venture beyond the known. Teachers often provide students choices within the classroom. However, restricting choices can be damaging to creative environments. Students should be given open-ended opportunities in order to grow and develop their creative ideas. When restricting choices, Einstein stated "This coercion had such a deterring effect upon me that after I passed the final examination, I found the consideration of any scientific problems distasteful to me for an entire year [Einstein, 1949]" (Grangrade, Kothari, & Verma, 2005, pg 57). Thankfully, he moved passed his immediate distaste for the problems and found a passion within the field involving inquiry and problem solving.

Interaction for students is important for their growth but constant supervision can have a deterring effect. The student needs to feel safe in order to explore, start over, try again, or muddle through without the feeling of being monitored. Guidance by coaching or critiquing is important but the idea of being watched does not allow for "private" mistakes and failures.

Much has been much written on the use of competition and collaboration. For the purposes of creative environments it is important to use competition where each individual can focus on their own independent creative process as well as the good of the group and not against the group (Urban, 2007). This type of competition promotes the growth of the group as a whole and doesn't concentrate on individual achievement.

Roger von Oech (2008) published a list of the following mental blocks in creative thinking. If these exist in the environment, then creativity cannot be fostered. These include:

- The Right Answer
- That's Not Logical
- Follow the Rules
- Be Practical
- Play Is Frivolous
- That's Not My Area
- Don't Be Foolish
- Avoid Ambiguity
- To Err Is Wrong
- I'm Not Creative

Teachers and students alike need to move past these mental blocks to develop their own creativity. If creativity is taught as just another skill to learn, then the purpose, goal, and joy in the creative process will disappear. Creativity should appear naturally but deliberately in a learning environment.

These creativity and mental blocks are important to consider in evaluating the environment. If the environment is not set up to encourage and move past these challenges then the development and growth of creative outlets will be difficult to foster.

Inspiring Teachers

Teachers are key in the development of students' creative thinking tools and skills. They should understand these tools, the importance of creativity, and the potential blocks. When asked, many teachers understand the importance of creativity. However, their question is, "When do I have time?" Understanding the outside constraints on the classroom is important when introducing creativity for the classroom. As we look at imbedding creative thinking skills, tools, and creativity into the classroom, we must first inspire teachers. One way to accomplish this is by providing targeted professional development focusing on creativity.

Professional development for creativity and creative thinking skills should be designed differently than a typical professional development session. For teachers to truly understand creative thinking skills and implement them with students they need to be imbedded into the teachers' individual practice. This can only happen by truly understanding and developing a passion for these skills. Creative thinking skills should be taught through hands on opportunities and a discussion about the skills utilized through the experience.

There are several ways to provide professional development including creative activities imbedded into staff meetings, professional development series, and half-day trainings. Giving teachers opportunities to discover their own creativity is important to their including it in their classrooms.

Imbedded creative opportunities could be dramatic activities, journal or book making, art activities, or others. These can be included for creativity's sake but should also encourage discussion about the process experienced during the activity. Further dialogue about classroom inclusion is helpful in providing strategies or tools to utilize in classrooms.

Providing opportunities for teachers to develop their own creative skills is one way to introduce the skills and focus on creativity. Organizing a professional development series of events provides focused opportunities to experience the joy and challenge of new activities in a safe environment while developing creativity skills. The activities in the series can include one specific activity or center based activities with multiple opportunities for teachers to explore creativity.

If constraints do not allow for a series of professional development days then schools should consider creating a half-day training. If a project is planned, make sure there is enough time to introduce the featured creative concept and to work on the project.

Activities and projects should be selected based on your group. Pushing individual and group boundaries with something unfamiliar to the teachers is beneficial while fostering creativity skills and demonstrating environmental elements. Everyone comes to professional development with various skills and comfort levels, so a safe, caring and nurturing environment is critical. A variety of activities and projects can encompass language arts, drama, logic problems, art, music, math puzzles and others. Selecting an assortment of creative activities will also demonstrate that creativity can be developed across content areas. The following are some activities that can be used for professional development.

• Journals

There are many types of journals that can be created and utilized. Journals can be made from scratch, covering and designing pre-made journals, or using pre-made journals. This activity should include creating and making the tangible journal as well as the purpose of the journal. Selecting a topic related to other professional development topics may be helpful for teachers. Many teachers utilize journals; however, it is important to emphasize the creative element, so making journals provides ownership for the students. There are many resources for creating various styles and types of books/journals. The following are some types of journals.

• Idea journals allow teachers to keep the content open by adding websites, differentiation techniques, strategies, quotes or anything to help them with a lesson(s) in the future.

• Art journals can be utilized to focus on various artistic elements seen in projects, techniques, or inspirational pieces.

• Reflection journals include entries for specific reflections on teaching practice, professional development topics, learning process, or readings.

• Artist Trading Cards

This is a format to create two-inch by three-inch (or any other size) cards that can be traded with others (but is not required). The cards can be created with a specific artistic medium or can be topic focused. The smaller design size is a less intimidating space for creation and exploration. To see examples, a general search on the Internet will display a plethora of beautifully created cards. Keep in mind that professional artists create many of the images found in the Internet search.

• Creative Challenges – physical materials or dramatic

Physical Materials

• Often these types of creative challenges include building or creating some thing with a limited set of materials for the purpose of solving a problem. These are often open-ended problems such as build as many hats as you can out of seven pieces of newspaper and labels. There are many books that focus on creative challenges. In addition, organizations such as Destination Imagination and Odyssey of the Mind publish materials with guidelines for creative challenges.

Dramatic Challenges

• Dramatic challenges encourage acting out a scenario or story to address a problem. Some utilize props while others may request no verbal language. The goal is to use drama to solve the challenge. There are many books on creative dramatics providing possible scenarios.

• Open Ended Problems

These can be short stories with a question to be solved (a five-minute mystery type story) or open-ended mathematical problems. These are often the logic-based problems which also engage critical thinking skills.

• Origami

Origami is a wonderful way to include a hands on activity that is instruction oriented but requires good spatial understanding. This is often seen as a "safe" choice for individuals who do not consider themselves artistic. When introducing and using origami in the classroom as a creative tool, make sure there are a variety of skill level directions available.

• **Zentangles**

This is an art form that appears to be doodling with more structure. The shapes and designs are simplistic. The more design and space provided the more complex the images/pictures become. Adding color is an additional way to add more depth and complexity to the activity. Individuals who are not comfortable with drawing tend to like this activity.

Creative activities can be found in a multitude of places, including books to purchase, organizations to join, social media postings, or as free resources on websites. Identifying the goal and purpose of the professional development will help in selecting the activities/projects to be utilized. The challenge is to provide a variety of projects focusing on the creative process so that teachers cultivate an understanding of the creativity skills and tools. All professional development activities should be scaffolded or tiered since the comfort and skill level are drastically different among teachers.

The development of creative thinking skills and creativity is important for students. If teachers are to teach these skills and imbed them into their classrooms, they need to be inspired to teach creativity by experiencing creative opportunities themselves. Professional development for creativity and creative thinking skills is important and will help provide teachers with inspiration and understanding for the classroom.

As teachers engage in professional development activities on creativity, they will understand the elements Torrance (1979) described of Fluency, Flexibility, Originality and Elaboration. With a true understanding of these elements, teachers can develop quality opportunities in their classrooms to engage students in creative experiences. Providing a variety of creative activities in a safe environment will empower teachers with various skill and ability levels, providing an openness to bring creative activities into their classrooms, ultimately expanding student creativity.

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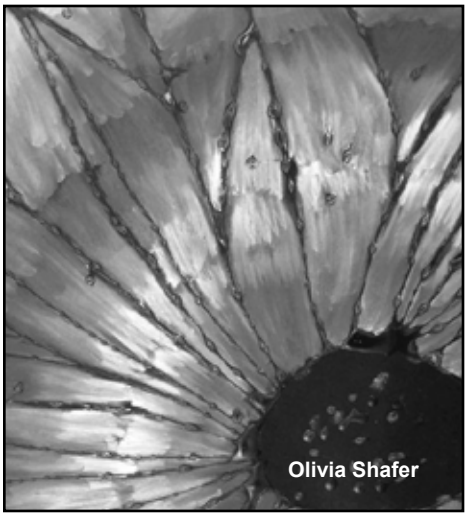

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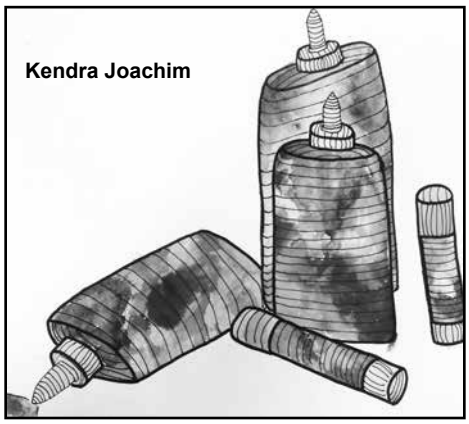


The Importance of IQ, MIQ, EQ, HQ & CQ!

by Rick Shade & Patti Garrett Shade

We all know people who were poor students in school and who turned out to be very successful in later life. We have also met people with high IQs and "book smarts" but no "life smarts." These people seem to have all the five senses but are missing the two most important ones . . . common sense and horse sense! We believe these "phenomena" exist because of the roles played by IQ, MIQ, EQ, HQ and CQ in real life demonstrations of intelligence. We are going to share some research and our thoughts regarding each Q as it relates to creativity.

What is IQ?

IQ (Intelligence Quotient) is a number based on the results of a single test that purports to measure an individual's intelligence.

Question: How do you believe we should define intelligence?

Let's begin the investigation of intelligence by taking a look at two accepted definitions. First, from "Intelligence: Knowns and Unknowns," a report from a task force convened by the American Psychological Association (Neisser, et al., 1996):

> ***Individuals differ from one another in their ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought. Although these individual differences can be substantial, they are never entirely consistent: a given person's intellectual performance will vary on different occasions, in different domains, as judged by different criteria. Concepts of "intelligence" are attempts to clarify and organize this complex set of phenomena.***

A second definition of intelligence comes from "Mainstream Science on Intelligence" (Gottfredson, 1994) signed by a group of 52 intelligence researchers:

> ***A very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings – "catching on," "making sense" of things, or "figuring out" what to do.***

As we examine both definitions, the one thing that stands out is that most of what is defined as intelligence cannot be measured on a single test. In 1983, Howard Gardner offered, "An intelligence is the ability to solve problems, or to create products that are valued within one or more cultural settings." We concur that intelligence is a much broader concept. In order to expand upon our understanding of intelligence we'd like to introduce a few additional "Quotients (Qs)" that can greatly influence an individual's successful demonstration of intelligence:

MIQ - Multiple Intelligence Quotient
EQ – Emotional Quotient
HQ - Humor Quotient
CQ - Creativity Quotient

The professional literature has countless definitions of intelligence; probably as many definitions as there are experts studying it! Perhaps thousands of books and professional papers have been written on the subject. It has divided the scientific and educational communities for many years. Controversies and debates still ensue over its exact definition, form of measurement and more importantly, its importance.

Here is yet another example of this challenge. *The Collins English Dictionary* (collins.co.uk) defines **intelligence** as "the capacity for understanding; ability to perceive and comprehend meaning." However, other definitions use such terms as the ability to

- learn and apply knowledge,
- manipulate your environment,
- reason and have abstract thought,
- adapt to a new environment or to changes,
- evaluate and judge products and ideas,
- comprehend complex ideas,
- have original and productive thought,
- learn quickly and learn from experience, and
- understand inter-relationships.

When researchers are asked about their definitions of intelligence, they often believe numerous additional factors are involved. They include things like problem-solving ability, mental speed, creativity, abstract thinking and memory. We agree that these (not easily measured traits) all play important roles in the standard definition of intelligence. Many educators view "intelligence" as a general or umbrella term covering a variety of related mental abilities.

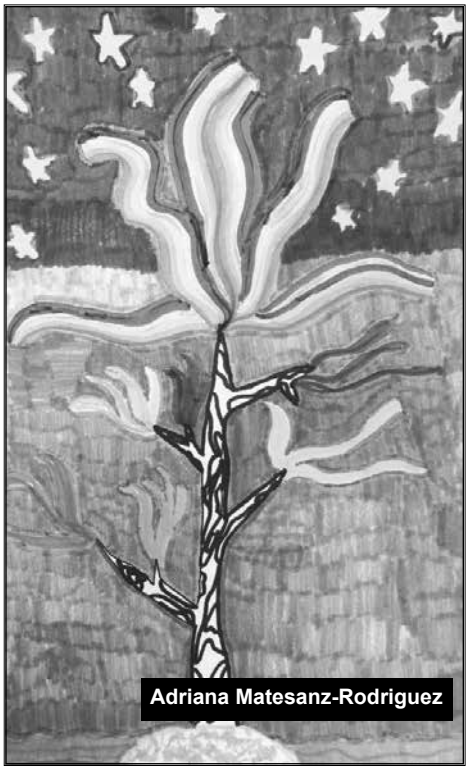
But let's expand this just a bit further. Take the fourth bullet, *Adapt to a new environment or to changes.* This involves the ability to interact with the environment, adapt to it, and hence overcome its challenges. However, the environment does not just refer to the physical surroundings (home, school, soccer field, etc.). It also includes social interactions with family, friends, classmates, team members, and more. So you see how the concept of intelligence is continually expanding.

Question: Can we measure such a fluid and ever-expanding phenomenon?

An IQ test purports to measure a person's cognitive ability compared to the general population. It is a standardized test, with a score of 100 as the average score. So a person with an IQ of 100 is considered to be of average intelligence compared to the rest of the population. The test does not measure how much knowledge one has accumulated or memorized, but rather a general ability to understand ideas. The test tries to quantify how well one reasons, distinguishes relationships, and solves problems. The IQ test also attempts to measure how well one can process information, especially the ability to store and retrieve it. It is generally believed that everyone's IQ (and we would argue not necessarily their intelligence) remains about the same throughout life.

Although IQ tests can predict general intelligence, we must keep in mind that they don't claim to tell the whole story of an individual's abilities. The IQ test does not measure creativity, emotional sensitivity, social competence, or various acquired skills that at times fall under the general heading of intelligence. For example, a person demonstrating exceptional creativity may have an average IQ test score. There is research to support that many of our highly creative children have an IQ in the range that is considered to be just below the gifted threshold. But we all know there is much more to success in life than that number. In 1995, Gardner introduced a new definition that aligns with our view of intelligence and creativity.

An intelligence is a biological and psychological potential; that potential is capable of being realized to a greater or lesser extent as a consequence of the experiential, cultural, and motivational factors that affect a person.


Adriana Matesanz-Rodriguez

What is MIQ?

For more than 60 years, educators believed intelligence could be summed up in this single test score. Then in 1983, Professor Howard Gardner challenged this view in a book called *Frames of Mind*. He proposed the Theory of Multiple Intelligences, suggesting human intelligence was much more than a single, easily tested phenomenon. At the time, Gardner proposed *at least seven* different intelligences. All people possessed each of these in varying degrees. To date, an eighth and ninth intelligence have been "added;" however, Gardner states that there could be thousands. The nine intelligences are as follows:

1. Linguistic - strength in language use (writers, poets, storytellers);

2. Logical/Mathematical - strength in seeing patterns and logical structures (scientists, mathematicians, computer programmers);

3. Musical - strength in understanding and expressing components of music (composers, musicians, singers);

4. Spatial - strength in perceiving the visual world (architects, surveyors);

5. Bodily/Kinesthetic - strength in handling objects skillfully and controlling the body (actors, crafts persons, athletes, sculptors, dancers);

6. Interpersonal - strength in the ability to notice other people's moods, motivations and temperaments (teachers, therapists, political leaders);

7. Intrapersonal - strength to access one's own emotions including moods, motivations and desires (entrepreneurs, artists);

8. Naturalist - strength in interacting with plants and animals (biologists, veterinarians, forest rangers);

9. Existential - strength in the sensitivity and capacity to address deep questions about human existence (religious leaders, philosophers).

When working with teachers on the concept of Multiple Intelligences (M.I.), we often refer to the following interpretation by Gardner: The question is no longer *"How smart are you?"* Rather, the question becomes *"How are you smart?"* We try to help teachers recognize and work with their students' M.I. strengths to help foster and support a more creative classroom climate. An exploration of

the Multiple Intelligences can lead to discovering multiple passion areas of learning. We refer to this as increasing children's Multiple Intelligence Quotient (MIQ).

When thinking about ***how*** children are smart, it is important to keep the following in mind:

- Children have all nine of these intelligences (in varying degrees).
- There are many ways to demonstrate intelligence in each category.
- The intelligences often overlap and work together.
- All these intelligences can be further developed with experience and practice.
- Encounters within the areas of the Multiple Intelligences can lead to the discovery of life-long passions.

All children are Multiple Intelligence learners! In U.S. schools the subjects of reading, writing, and math are still the *coins of the realm.* They are the primary foci of teaching, as well as the heart of standardized testing. The English and math lessons often matter most in relationship to attention, reward, and other forms of acknowledgment in our schools. Although these two areas have a critical role in the overall learning process, all students learn well using several of the other Multiple Intelligences. The intense drill and repetition of the literacy and mathematical skills are a part of the problem causing creativity to decline early in children's schooling. All the while creativity could be the very thing that could be used to rigorously engage children in these subject areas. There are some teachers (remember your favorites) who innately teach with creativity using a Multiple Intelligence approach. Their skill sets include the ability to

- recognize and address learning differences and preferences in their students,
- continually grow their toolbox of creative instructional strategies,
- provide a balance of challenge and choice in their curriculum offerings,
- maximize learning and engagement in their students,
- create multi-teaching work environments where learners are often not doing the same thing,
- support the growth of knowledge and creativity skills equally, and
- provide for the continuous exploration of passions and product development.

We believe this level of expertise in teaching should be referred to as the 10th intelligence!

Teaching with the Multiple Intelligences at school and home easily allows for the demonstration of children's creative behaviors and passion explorations. Encourage children to pursue and demonstrate learning though all the modes:

1. Linguistic - creative storytelling/ writing to express thoughts or ideas;

2. Logical/Mathematical - creatively solving and designing problems;

3. Musical - creating music or rhythmical patterns;

4. Spatial - creating and learning visually – through drawing pictures or diagrams;

5. Bodily/Kinesthetic - creating through movement or building with hands or body;

6. Interpersonal - creatively resolving conflicts with peers or siblings;

7. Intrapersonal - creatively leading groups or organizations;

8. Naturalist - using natural environment materials to create and learn;

9. Existential - using imagination and creativity to ponder big ideas.

Patti, as a former State Director of Gifted and Talented, was often asked by parents and educators, "What can I do to support my child's interests and strengths?" Her answer is to use the Multiple Intelligences categories as a framework for exploring creativity and passion learning. Children don't know everything they are good at or how strong their interest might be if they haven't had experiences in a particular area. Patti calls this lack of exposure during their education as being raised in "educational closets!" Developmentally, some passions may come and go (trucks, dinosaurs, etc.), but it is the job of an educator or parent to make sure children have a broad range of experiences during childhood and adolescence so they can find the ones that will help them become creative, life-long learners and producers.

As you begin to provide experiences for children in all the Multiple Intelligences, start having conversations with them about their interests and strength areas. Ask how they think they learn best. Have them identify what most interests them and to describe their passions. It would also be very appropriate to discuss this during parent-teacher conferences on an on-going basis. This will help teachers and parents better understand and encourage the growth of passion-based learning in all children.

A further step is to have children create products following experiences in one or more Multiple Intelligence areas. You can enlarge the chart that follows to record these experiences in the different intelligences. Sample products could be created in each of the nine Multiple Intelligence areas. The children can complete the products independently or together or with the support of an adult, depending on their age. As they grow and mature, it is important that they become more independent and work with others while developing creative products.

As you can see in the chart that follows, we encourage using technology in the development of the products (another gap you can help fill). If this

is intimidating, think about bringing in a high school student to mentor you and your students in using new tech tools! Blended learning, developing creative products with technology, is no longer optional in today's classrooms.

MULTIPLE INTELLIGENCES CHOICE BOARD		
BODILY/KIN.	LOGICAL/MATH	INTERPERSONAL
Perform a mime play of British history	Build a board game with algebraic functions	Write a children's book about friendships
INTRAPERSONAL	EXISTENTIAL	MUSICAL
Make an alphabet book of world leaders	Design a mind map of major religions	Create a video of music genres
NATURALIST	VERBAL	VISUAL/SPATIAL
Build a model of an ecosystem	Research & debate a political topic	Film a stop-action animation
Use Web 2.0 Tools and Apps		
MULTIPLE INTELLIGENCES AND PRODUCTS		

What is EQ?

If you look back at the nine intelligences identified by Gardner in his Theory of Multiple Intelligences, you will note that two, Interpersonal Intelligence and Intrapersonal Intelligence, specifically involve emotions. In 1995, Daniel Goleman wrote *Emotional Intelligence,* in which he describes how Peter Solovey subsumed Gardner's personal intelligences and expanded the concept into five abilities (domains). The major components of Emotional Intelligence (EQ) follow.

1. Knowing one's emotions is being self-aware, or recognizing a feeling as it is happening. The ability to monitor feelings from moment to moment is critical for self-understanding and confidence when making personal choices. This skill also involves knowing your strengths, weaknesses, values, drives and impact on others.

2. Managing emotions is being able to handle feelings appropriately in order to bounce back from life's setbacks and disappointments. It also involves learning how to redirect or control disruptive impulses or moods.

3. Motivating one's self is the ability to gather together the emotions necessary for essential skills such as self-motivation and creativity. This also includes learning how to delay gratification and stifle impulsivity. These skills are the foundation of any successful accomplishment.

4. Recognizing emotions in others is the ability to empathize. People with the ability to be empathetic are more able to determine what others need or want. Children will use this skill of understanding other peoples' emotions to build friendships and navigate other relationship experiences.

5. Handling relationships involves acquiring the specific skills needed for social competence (i.e., popularity, building rapport and trust with others, interpersonal effectiveness and leadership).

Schools continuously advertise their successes in the *coins of the realm* academic areas. Yet, many people (parents, business leaders, etc.) maintain that the greater need is for support and development of an individual's EQ. Imagine this advertisement: "We don't claim to make your child smarter – we do claim to find your child's passions and make them excited and happy to come to school!" Which school would you choose? We don't know about you, but we'd certainly go with a school proclaiming guaranteed happiness.

In *The EQ Edge,* Stein and Book (2006) discuss how success at work relates to both EQ and IQ. They state that IQ predicts an average of 6% of success in a given job, while EQ is directly responsible, depending on the field, for between 27% and 45% of job success. Having a high IQ and an underdeveloped EQ can hold one back. We may be smart, but if we have abrasive behaviors, we turn off others and they never notice our abilities.

EQ skills may give one a competitive advantage in the workplace. Cohn (2012) investigated fundamental leadership qualities and presented them in an article entitled "Why we pick bad leaders, and how to spot the good ones." False predictors of successful leaders include "a sparkling personality, a polished resume, or good interview skills." He said leaders fail when they lack one or more of the following attributes:

- **Integrity** – the core foundation for leadership effectiveness;
- **Vision** – assisting in persuading and inspiring others to head in a new direction;
- **Passion** – enabling the leader to move forward when the going gets tough;
- **Courage** – mediating adversity and making tough decisions;
- **Judgment** – making solid decisions and choices (focusing, prioritizing, asking good questions, etc.);
- **Empathy** – understanding what makes other people tick;
- **Emotional Intelligence** – internally focusing and allowing one to acknowledge weaknesses and strengths.

Happiness is also a somewhat surprising EQ strength for success at work. The ability to feel satisfied with your life, enjoy yourself and others, and have fun can improve work performance. Happy people usually show enthusiasm at both play and work. Happy people easily attract and build relationships with others.

Helping children improve their EQ has a number of benefits. Among them are increased motivation, self-esteem, creativity, and achievement. As children become more comfortable in exploring their creativity, they will be more open to ideas, more eager to explore, more willing to work with others, and more interested in discovering new things. You may see them becoming more *resourceful* and *open-minded*. This will help them more easily trust their instincts and hold a positive attitude when working toward solutions to problems. You may also notice children being more flexible when approaching new challenges and willing to celebrate their accomplishments. As Thomas Dewar stated, "Minds are like parachutes - they only function when open." (http://www.brainyquote.com/quotes/quotes/t/thomasdewa142165.html)

Another way to look at the importance of EQ comes from Gardner (1995). When discussing the role of emotional and relationship abilities with Goleman, Gardner stated,

> ***Many people with IQs of 160 work for people with IQs of 100, and the former may have poor interpersonal intelligence and the latter have a high one. And in the day-to-day world, no intelligence is more important than the interpersonal. If you don't have it you will make poor choices. We need to train children in the personal intelligences in school.***

IQ and EQ are separate abilities, but not opposing ones. There are a number of tests for IQ, yet none really exist to yield an EQ score. However, we all recognize positive traits and behaviors of high EQ. In our text, Curiosita Teaching: Integrating Creativity Into All Teaching & Learning (2014), we compiled a self-check list for the four categories that we included in the Multibilities Philosophy of the Curiosita Teaching Program™. Strengths in these four categories contribute to successful creative productivity: Practical, Diverse, Creative, and Emotional Intelligence. Take a look at the specific attitudes and abilities listed below in the categories of Emotional and Practical Intelligences.

Curiosita Teaching Multibilities Philosophy Sub-categories

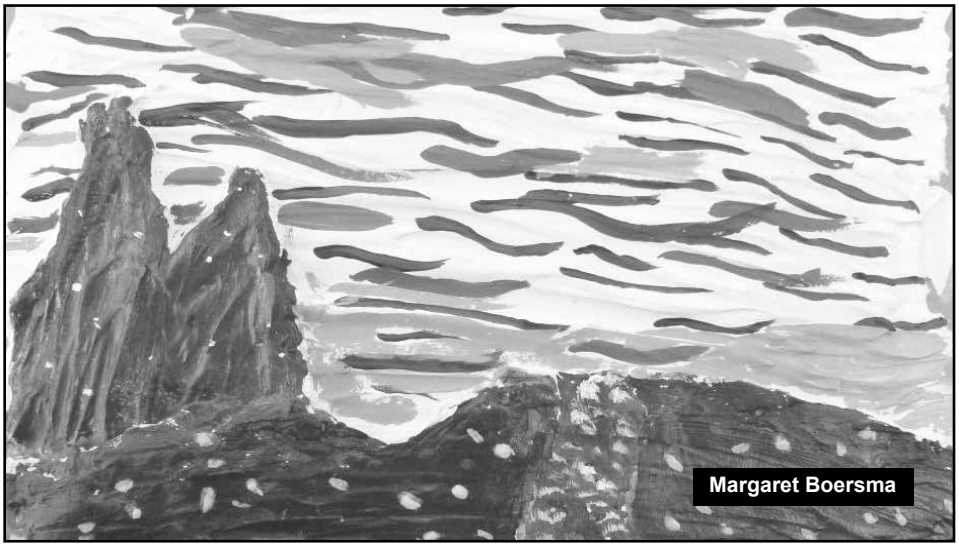
Emotional Intelligence

1. I am happy when others succeed.
2. I know how my feelings affect my energy level.
3. I can share ideas easily with others.
4. I do not get mad often when working with others.
5. I feel excited when I get to work with others on projects.
6. I can motivate myself to work hard on a project.
7. I stay calm even when it doesn't work the first time.
8. I don't let my feelings stop my thinking.
9. I get energized when working with others.
10. I don't need praise or compliments to keep working hard.

Practical Intelligence

1. I can see through the "fluff" and focus on important things.
2. I can quickly find solutions to problems.
3. I often get asked by friends for ideas or solutions.
4. I will try many ways to solve a problem.
5. I can explain how to solve a problem.
6. I can blend friends' ideas to get solutions.
7. I can figure out exactly what the problem is that needs to be solved.
8. I am told I have a lot of practical or common sense when I make choices.
9. I can look at all the options and choices before making decisions.
10. I can solve problems others sometimes can't.

The attitudes and abilities listed above can be developed in children by teaching them tools. Children will also be strongly influenced as parents and educators model handling the positive and negative life experiences. A lack of the development of these traits are often the downfall of many "highly creatives."



What is HQ?

Now let's examine the relationship between humor and creativity. We refer to this as the *Laughter-Learning Link*. There is also a strong humor-creativity connection. As Arthur Koestler stated, "HA-HA leads to A-HA!" Both play and humor aid in the development of creativity and are part of your child's humor quotient (HQ) (1967).

Research on creativity has shown that humor has a positive effect on the ability to generate a greater quantity of ideas as well as to improve the quality of creative thinking in groups. However, teachers and parents generally tend to send the message that school and homework are always very serious business. Children also directly or indirectly receive this message when they overhear their parents discussing their own work environments. We acknowledge that playfulness and humor can sometimes appear to be inappropriate (time and place). But unfortunately, the most common reaction is to *suppress all humor,* not just the inappropriate kind.

When we hear laughter coming from a group of children in school, our first thought is apt to be, "Are they paying attention?" In fact, their entire brain is working together to fully appreciate the joke in order for the humor to work. First, the left hemisphere of the brain starts to process the words, and then the frontal lobe activates emotions. The right hemisphere almost immediately processes a pattern and within a few milliseconds the occipital lobe shows increased activity. Delta waves then increase and the brain comprehends or "gets" the joke; happiness and laughter soon result. So the entire brain is involved in the humor process! Of course, this does not mean the students are on track, but they (and their brains) are definitely paying close attention to something! The "trick" is for you to be able to use humor appropriately to deepen their engagement in the educational task at hand.

Albert Einstein once said, "To stimulate creativity one must develop childlike inclination for play and the childlike desire for recognition." (http://creatingminds.org/quotes/children.htm). Our children have this requirement in abundance. It is up to us to protect and nurture it. Hold on to this thought: humor involves many parts of the brain and *humor and play* relate strongly to the creative process. Humor is a very powerful educational and life tool.

What is CQ?

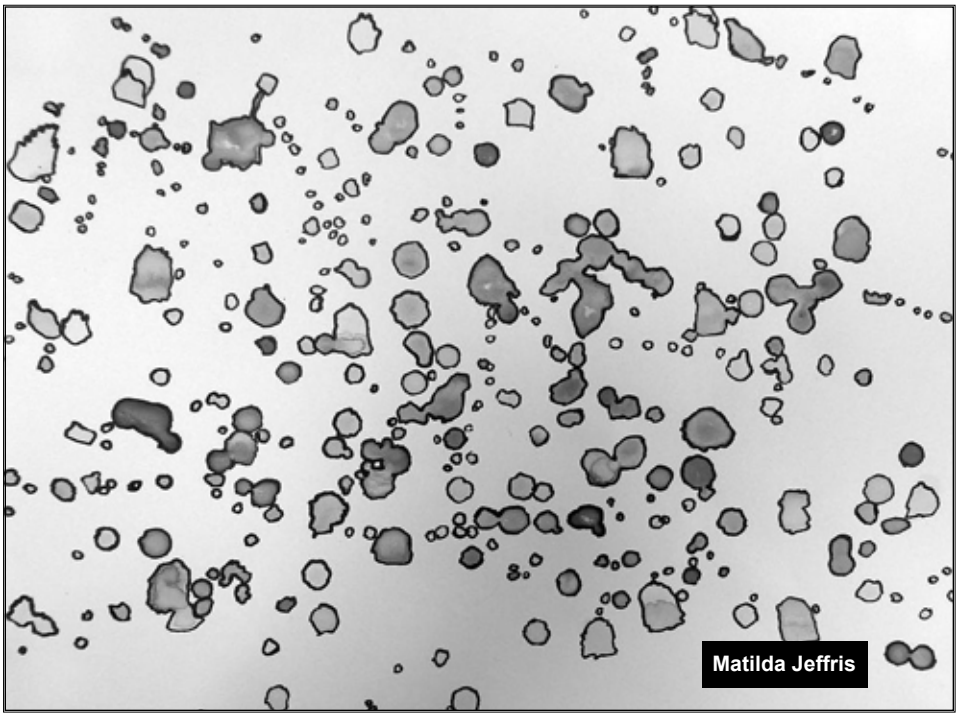
If an Intelligence Quotient (IQ) and an Emotional Quotient (EQ) are acceptable academic and social concepts, then it stands to reason we should also explore children's Creativity Quotient (CQ). To start this process we probably should begin with a definition. Now the challenge begins again!

Just as the definition of intelligence is multi-faceted, the same is true for a definition of creativity. Over the years, volumes of research on the concept of creativity and creative thinking have been published in journals and books. Does that statement sound familiar? While exploring different aspects of creativity, authors and researchers developed definitions that often overlapped in their underlying constructs or were used interchangeably. This resulted in many different meanings and conceptualizations. Most of us have formed our own ideas, so now the picture quickly becomes muddled and wearisome.

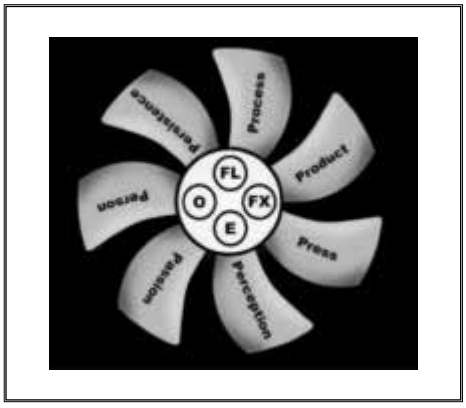
In 1996, colleague Don Treffinger published a list he compiled of 112 definitions of creativity used in the professional literature. Famous creativity researchers Taylor and Getzels (1975) perhaps summarized it best when they stated, "Definitions of creativity are often misleading; they say too much and too little." However, there may be some light at the end of the tunnel. Although over 100 definitions of creativity exist in the literature, each of these contains at least one of the following four elements. The Elements of Creativity are:

- **Fluency** – generating a great number of ideas;
- **Flexibility** – creating ideas in a wide range of categories;
- **Originality** – producing unique, novel, or one-of-a-kind ideas;
- **Elaboration** – adding details to enrich, refine, or embellish ideas.

If you understand the four Elements of Creativity, you are well on your way to understanding part of what comprises one's CQ. However, there is much more!



To help parents and educators understand the complexity of CQ we developed a model of the creative process, The Creativity Fan. This model depicts the interrelationship between the four Elements of Creativity (lights) and the seven components (blades) of The Creativity Fan. As you are introduced to each blade (component), you will notice that individuals may demonstrate mild, moderate, or intense levels of the abilities and attitudes described in each component.



The Creativity Fan Model

• **Process** – Individuals have their own way of processing and assimilating information and ideas. Some children may seem more natural at this, while others may struggle to think "outside the box." In any event, ***all children*** can improve their creative thinking. We can teach them tools and processes designed to enhance their ability as well as their confidence in doing so.

• **Persistence** – Creativity involves the hard work necessary to bring an idea from possibilities (dreams) to completion (reality). Without persistence, simple mistakes, minor failures, peer influence, or self-doubt can quickly take over and cause children to abandon their work; they simply give up. Persistence is the "sweat" Edison refers to when he remarked, "Genius is one percent *inspiration* and ninety-nine percent *perspiration*." (http://www.brainyquote.com/quotes/quotes/t/thomasaed109928.html) Children (and adults) need to view failure as an opportunity to learn! Another way to think about this comes from Regina Dugan who stated, "What would you attempt to do if you knew you could not fail?"

• **Product** – When you immerse yourself in the creative process, you demonstrate the result of your creative efforts through some sort of visual or verbal product. Many times, we can forget that individuals may produce 10-20 "average" or even "bad" ideas or products for every successful one. Children will continue to develop their creative skills with each product. We know Leonardo da Vinci is most famous for the *Mona Lisa*; however, it is believed he produced over 4000 paintings, drawings and sketches.

• **Perception** – Creativity often involves changing perception (i.e., looking at something in a new way or from different points of view). We previously discussed the importance of the Persistence fan blade. We may challenge children to "work harder" or "think harder." But if this is done within the same context, the result may be frustration and failure. You may need to guide children to look at the problem from a different angle. To be able to change their perception requires continuous practice. This involves taking an intellectual risk, making a guess, examining something from alternate viewpoints, reversing an approach, or trying something completely new. Perception comes through our senses, but it is what we do with it in our mind that counts!

• **Passion** – Children may develop many interests throughout their lives. They are truly fortunate if one of those interests turns into a passion. These can become the foundation of their dreams, visions, inspirations, and goals. Genuine passion, a desire to achieve something, is the fuel for creativity. The strong feelings associated with a passion area will determine the levels of dedication, motivation, and enthusiasm with which they pursue it. The real message here to you and all children is that learning can be intense, joyful, and energizing!

• **Person** – There exist numerous checklists describing the traits and characteristics of creative individuals. We would like you to instead think of children not as labeled "creative children," but as children who exhibit ***creative behaviors*** at certain times and under certain conditions. At times, they may be passionate, but not always. At times, they may be intensely curious, but not in all circumstances.

• **Press** – These are the physical, emotional, and psychological influences on your child's creative thinking process. The Press is twofold: external and internal. External Press involves conditions imposed from the environment. An example may be a time limit. This brainstorming must be finished in the next 90 seconds. This external demand will influence the creative process. With internal Press, an individual may need specific sights, sounds, scents, or feelings to assist and encourage their creative work. For example, when writing this book, we often needed to listen to music during the creative writing process. Children will eventually identify and select forms of Press that help increase their personal creative output.

The level of development in attitude and ability (described in each component of The Creativity Fan) greatly influences the creative output of individuals. Our perspective is that creativity may best be understood by a working fan analogy. Imagine creativity and creative thinking as a whirling fan with seven blades (components) and four lights (Elements of Creativity) in the center. When the fan is turned on, the seven blades work but not necessarily in unison. During any part of the creative process, one or more of the fan blade components and one or more of the Element fan lights may be called into play. Here's a favorite quote from Eli, a seventh grade student. "To me, creativity is like a meteor shower of thoughts and ideas spinning off into infinity!"

In addition to understanding the process of creativity, it is important to recognize some of the specific attitudes and abilities that contribute to successful, creative productivity. As previously discussed, we grouped these into four categories of intelligences: Diverse, Creative, Practical and Emotional. These are the four intelligences that make up the Multibilities Philos-

ophy of the Curiosita Teaching Program™. Earlier, we reviewed the categories of Practical and Emotional intelligences. This table gives you a more detailed look at the Diverse and Creative intelligences.

Curiosita Teaching Multibilities Philosophy Sub-categories
Diverse Intelligence
1. I can easily accept different ideas from other people. 2. I value or appreciate opinions of others. 3. I enjoy unusual and different kinds of thinking. 4. I like to work with others who question each other. 5. I like wild, unusual and weird ideas. 6. I enjoy working with people who have different kinds of talents or skills. 7. I am not bothered when others think differently than I do. 8. I believe slow thinking can be as good as fast thinking. 9. I am open to others' viewpoints and opinions. 10. I can easily change my mind if another person's idea is better than mine.
Creative Intelligence
1. I have unique and original ideas. 2. I think of ways to connect unusual things. 3. I like to play with ideas to get better ideas. 4. I ask questions that spark others' interests and thinking. 5. I am very good at brainstorming. 6. I think "can do" when working on problems and I don't get easily discouraged. 7. I really enjoy coming up with new ideas for creating things. 8. I get new ideas when I get lost in my daydreams or thoughts. 9. I have a wacky sense of humor and sometimes have to explain my laughter. 10. I have interests in a variety of things.

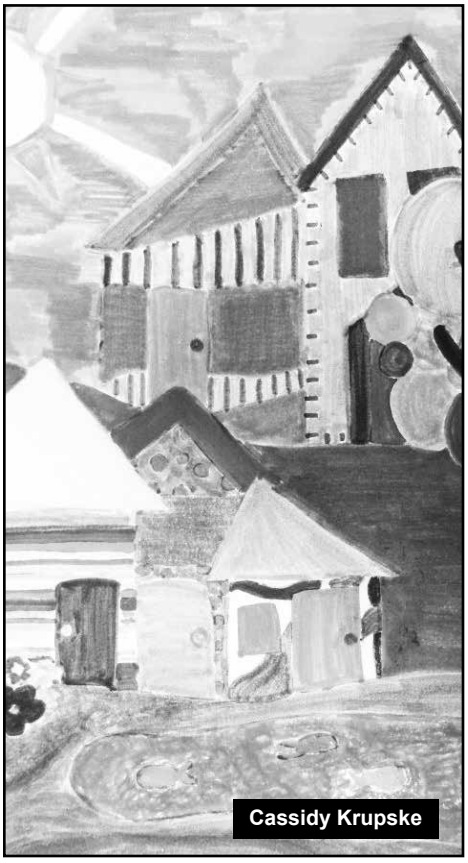
The traits listed can be developed in children by teaching them tools and strategies and by modeling healthy behaviors and reactions to life experiences—in this case, those that involve creativity and diversity. Again, we cannot stress enough that a lack of development of the traits in these two columns is also often the downfall of many "highly creatives". They fail to understand their own complex creative behaviors and don't realize how important it is to accept their own "individual" diversity as well as the diversity of others.


Amber Moca

Which "Q" Matters Most?

We all have our personal school experiences that have affected our Qs. Schools are about academics: math, science, reading, writing, social studies, art, music, physical education and occasional electives in middle or high school. Standardized tests are generally about math, reading, writing, and science. However, we would argue that the school scene is probably at least 50% academic and 50% all the other Qs. If we follow this logic, why do we not assess or evaluate all Qs in the same way we assess academic intelligence? Wouldn't it be interesting if your son or daughter brought home a report card like the one on page 46?

Just imagine the curriculum we would have to create to generate evidence of the student's proficiency in each of these 15 traits! Imagine the learning opportunities students would need to be afforded to measure their proficiency in these traits. It could completely change education in some very important and fundamental ways. And best of all, children's creativity would flourish!


Cassidy Krupske

Q REPORT CARD			
SUBJECT	DESCRIPTION	GRADE	COMMENT
EMPATHY	Is sensitive to feelings and points of view of others; caring		
SENSE OF HUMOR	Uses appropriate humor often		
TOLERANCE	Accepts ambiguity and diversity		
OBSERVANT	Sees details; shares facts and opinions		
ASKS QUESTIONS	Is curious and asks many questions; wonders; is in awe		
SELF- CONFIDENCE	Uses strengths to boost competence		
IMAGINATIVE	Uses and acts upon imagination in work		
RISK TAKER	Takes acceptable/ educated, intellectual risks		
DAYDREAMS	Appropriately daydreams throughout the day		
PERSISTENT	Works hard; exhibits task commitment; has grit, diligence, and effort		
EXPLORES INTERESTS	Has a variety of interests/ hobbies		
FAILS OFTEN	Learns from mistakes; guesses; predicts		
ADAPTABLE	Is flexible and resilient in thinking; embraces change		
ENERGETIC	Is passionate and enthusiastic		
HAPPINESS	Is content; joyous;has feelings of well-being		

Question: What if these Q "subjects" had as much value as math, reading and science?

Let's take a closer look at E. Paul Torrance's Manifesto for Children in light of the areas we have discussed in this article. In 1983, he wrote these remarkable words which give most educators a "pause for the cause" when they reflect on the purpose of their own teaching.

Manifesto for Children

1. Don't be afraid to fall in love with something and pursue it with intensity. (Passion blade)

2. Know, understand, take pride in, practice, develop, exploit and enjoy your greatest strengths. (Multiple Intelligences)

3. Learn to free yourself from the expectations of others and walk away from the games they play. Free yourself to play your own game. (Multi-abilities Philosophy)

4. Find a great teacher or mentor who will help you. (Modeling)

5. Don't waste energy trying to be well rounded. (Passion & Person)

6. Do what you love and can do well. (Creative & Practical Intelligence)

7.Learn the skills of interdependence. (Diverse & Emotional Intelligence)

Unfortunately, creativity rapidly declines when children enter school and continues to decline into adulthood. There is one bright light at the end of this horizon. Many adults begin to demonstrate increased creativity as they get older. William Carlos Williams, known for his poetry, was also a doctor. In his early 60s, he suffered a stroke and it prevented him from practicing medicine. He developed severe depression and was hospitalized for a year. He pulled out of his depression, aided by writing poetry. He published his work ten years later. His *Pictures from*

Brueghel and Other Collected Poems was awarded a Pulitzer Prize in 1962. In his late-life poetry, Williams stated, "Old age adds as it takes away." It was through this creative expression that he added to his life while aging.

The Creativity and Aging Study was conducted at the George Washington University Center on Health, Aging & Humanities with Gene Cohen as the principal investigator. It was the first formal study examining the influence of art programs on the general health, mental health, and social activities of older people. He stated:

> ***The "graying" of America – being heralded by many as the second American Revolution – promises dramatic changes in the field of aging. Arguably, one of the most profound changes is a new way of seeing older adults, moving from a "deficit" approach that stresses losses to an "asset" approach that stresses strengths, potential, and achievements.***

Gene Cohen asserts, "There is no denying the problems that accompany aging. But what has been universally denied is the potential. The ultimate expression of potential is creativity." It is Cohen's groundbreaking research that found a direct link between creative expression and healthy aging. Here are more examples:

• Anna Mary Robertson—"Grandma Moses"—was in her 70s when she began painting scenes of her rural life in upstate New York. This self-taught artist became one of the most famous American folk artists of the 20th century and continued painting into her 90s.

• Louise Nevelson was in her 50s when she sold her work to three New York City museums and now her art can be seen internationally in more than 80 public collections. Shortly before her 60th birthday, she became President of the Artist's Equity New York Chapter.

• When she was just months shy of her 50th birthday, Julia Child collaborated on her first French cooking book, *Mastering the Art of French Cooking.* Soon after, she promoted her book on television and that catapulted her as an overnight sensation in the culinary world.

• Colonel Sanders of "finger lickin' good" chicken fame had a difficult start in life but early on realized he had a creative cooking talent. However, it was not until he was in his 60s that he started KFC and became a millionaire.

• Laura Ingalls Wilder wrote about her family's life in the 1870s and 1880s in the acclaimed *The Little House on the Prairie* series of books for children. She published her first book at the age of 65.

• Louis Kahn, a Russian immigrant, was an important architect of the 20th century. He created his first important piece of architecture, the Yale University Art Gallery, when he was in his 50s and continued to design notable academic buildings.

• As a jobless architect during the Depression, Alfred Mosher Butts invented *Scrabble,* which became the most popular word game in the world. He did not realize success of the game until his early 50s when Macy's placed a large order and promoted it.

• Charles Darwin was 50 years old when he published his complete theory of evolution in *On the Origin of Species.* It sold out the first day it was released and subsequently had six editions.

This is a short list of many people in various creative venues who pursued their passion and realized success at age 50 and beyond. These "late bloomers" shared an exceptional ability to persevere with a brilliant talent that would not remain quiet. They enriched our lives as a result of their determination and creative spirit. Their work exemplified that "old age" is not simply a negative consequence of living. Cohen goes on to discuss several reasons why we exhibit more creative behaviors as we age.

• We begin to re-evaluate our life. We begin to think: Where have I been? Where am I now? Where am I going? In some, it may trigger a mid-life crisis. But in a much larger group, it triggers a constructive mid-life re-evaluation. For example, Alex Haley, when in his middle 40s, began a decade-long quest through Africa and ended up writing *Roots.*

• The re-evaluation stage is followed by a liberation phase. When people reach their sixties, they know who they are. They know that if they make a mistake, it is not going to be the end of the world. More importantly, they don't necessarily care what others think and they know it is not going to change the view they have of themselves. So they feel freer to do something that they have never done before. It is sort of an "If not now, when?" phenomenon.

• As people move into their 70s and early 80s or beyond, they move into a summing-up phase. There is an increase in storytelling and autobiography across all fields. When summing up, many people think about what they have gained in life, and they give it back not only in storytelling, but also in volunteerism and philanthropy. They deal with unfinished business.

• Then comes the encore phase. People used to describe this as their "swan song." This implies it is a single event. The playwright George Abbott provides us a great example of the encore stage. It was amazing enough that he wrote *Damn Yankees* when he was 68 years old. But, as an encore, he revised it when he was 107!

Enter Grandparents! Grandparents also have several additional life variables that provide them with more opportunities for being creative. Among these are an increase in leisure time, lack of workplace pressures and for many – much less stress. These and other contributing factors allow them to be great creative role models/partners for children and grandchildren. Grandparents also share the joy of re-visiting their

childhood state-of-mind—being playful right alongside their grandchildren! Just imagine how fun it would be to wake-up in the morning and say to yourself, "What am I going to play today?"

Everyone has a role to play in supporting the development of children's creativity, but once they enter school, teachers are the ones who spend the most time with students. This time factor alone makes it critical that our schools have the freedom and support to integrate all teaching and learning with creativity. Inspired by Torrance's manifesto, we designed a Classroom Creativity Creed for the Curiosita Teaching Program™ that depicts how learning occurs in a creative classroom.

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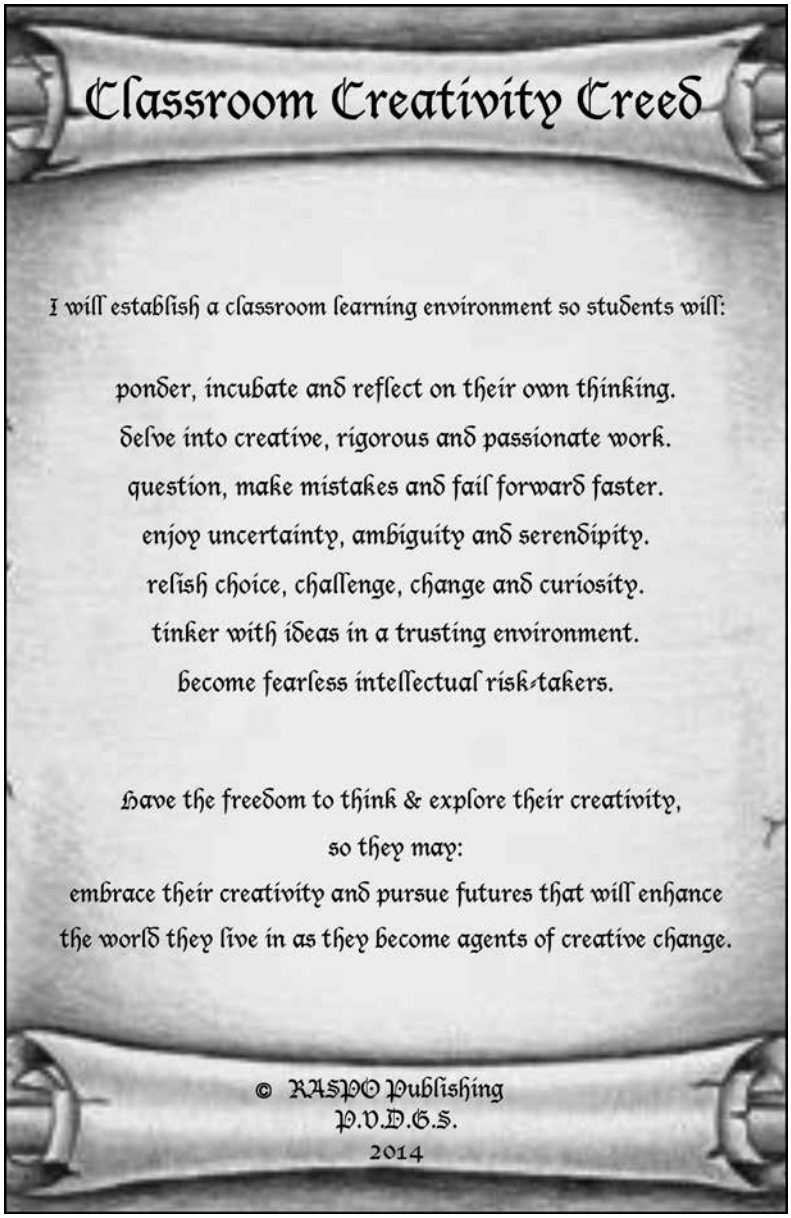


Creativity: Many Questions, Fewer Answers

by Maurice D. Fisher & Michael E. Walters

Thousands of geniuses live and die undiscovered –
either by themselves or by others.
- Mark Twain

E. Paul Torrance opened up the study and application of creativity studies in the public schools. Through his extensive efforts and lessons, developed in the 1960s and 1970s, he made teachers aware of a second curriculum beyond traditional academic studies – creative production, innovation, unique ideas and exercising students' imaginations (Torrance, 1970; 1979). He demonstrated over and over again that creative thinking can be learned through systematic practice similar to learning history or literature.

We intend to demonstrate this practical approach to the study of creativity by first presenting some basic assumptions, and then illustrating the importance of studying the lives and works of highly creative individuals. These assumptions are:

1. Creativity is specific to the individual and specific domain being worked on. The areas of music, art, literature, dance, mathematics, science, and so forth have unique processes and applications that should be studied in conjunction with the creative individual's early development, and later background and opportunities.

2. As related to 1 above, there is no general definition of creativity that applies across all domains or even to a few domains of knowledge.

3. The development of an individual's creative production needs to be studied from two chronological perspectives, i.e., from childhood to adulthood, and backwards from adulthood to childhood. These overlapping perspectives will provide educators with a more comprehensive understanding of creative development than just examining the early to adult years or vice versa.

4. Educators must immerse themselves in the creative productions of specific individuals. To study the life and works of Jane Austen, Charles Dickens, or Mark Twain, their books must be thoroughly analyzed and related to their lives. In like manner, cultural, political and economic forces should be included in this analysis.

Clearly, there will be many questions about how creativity develops as the result of applying these assumptions. Many gaps will likely occur in obtaining the information necessary for understanding how a particular individual becomes creative. But the search for even partial answers could help to illuminate how an individual produces a great work of art, literature, technology, or science. The following are examples of highly creative individuals and some questions about them.

Walt Whitman (1819-92), Master of Poetry

I Saw In Louisiana A Live Oak Growing

I saw in Louisiana a live-oak growing,
All alone stood it and the moss hung down from the branches,
Without any companion it grew there uttering joyous leaves of dark green,
And its look, rude, unbending, lusty, made me think of myself,
But I wonder'd how it could utter joyous leaves standing alone there without its friend near, for I knew I could not,
And I broke off a twig with a certain number of leaves upon it, and twined around it a little moss,
And brought it away, and I have placed it in sight in my room,
It is not needed to remind me as of my own dear friends, ...

1. How did Whitman develop the refined observational skills to write so enthusiastically about nature and citizens from different areas of the country?

2. How did his travels throughout the United States affect poetic imagery?

3. How did his egocentricity lead to a universal understanding of different types of people?

4. What factors in his early life in Long Island and Brooklyn affected his development as a poet and writer?

5. How was his creativity affected by his Quaker background?

6. Who were some of the individuals in the printing and publishing businesses who encouraged his literary interests?

7. Study his writing of *Leaves of Grass.* Why did Ralph Waldo Emerson strongly support this book?

Johannes Brahms (1833-97): Inspiring Unifier of Classicism and Romanticism

There are people who vindicate the world, who help others live just by their presence.

-Albert Camus (The First Man, 1995, p. 35)

A few months ago at three o'clock in the morning, I found myself (Michael Walters) unable to sleep. I proceeded to read and listen to the classical music radio station. It was playing *A German Requiem* by Johannes Brahms. The experience was like a religious service and the hour and a half performance went by as if I was in a timeless zone. The only time that was relevant was the sense of being totally enveloped within the music and text of this profound work. I was overcome by the realization that this music was a living reality of the *sensibility* of giftedness. The next day I began to study the life of Johannes Brahms to learn about this obviously unique musical genius.

One of the major books on the life and art of this great composer is *Brahms: His Life and Work* (1982) by Karl Geiringer. The author was an Austrian academic and an expert on the life and music of Bach and Brahms. Geiringer fled Vienna after the entry of Hitler's army and emigrated to the United States where he became a professor of the history of music at several American universities including Boston University and the University of California at Santa Barbara. His biography is primarily based on studying Brahms' letters. It is written in a wonderful narrative style that combines musical description and lucid prose which are easily accessible to the layman. Every teacher of the gifted should read this book because it captures the holistic texture of how personal sensibility combined with a community of giftedness to create a genius. For Brahms, his youth exemplified the German version of the African proverb

– "It takes a village to educate a child."

Brahms was born and raised in the most humble sections of Hamburg, Germany. His parents were artistically inclined individuals. His father was a musician in Hamburg who played in several civic musical organizations. Yet, despite these economic and social limitations, his giftedness was recognized, appreciated and nurtured by his community. As a teenager, Brahms played in taverns located on Hamburg's waterfront. His talent was brought to the attention of a music teacher who made Brahms' musical development a major personal endeavor. This teacher, Freidrich Wilhelm Cossel, was an excellent pianist who was not satisfied with mere technique but demanded that his students gained a thorough intellectual and aesthetic appreciation of the compositions they learned. Cossel inculcated in his students a sense that every musical work was sacred and could only be appreciated with reverence. Brahms' musical development was so accelerated that Cossel's teacher, Eduard Marxsen, a famous composer of that time, took on Brahm's musical education without receiving any remuneration whatsoever. Brahms was so appreciative of his teacher Marxsen that, even in his mature years after he was successful, he continued to correspond with him and send him manuscripts for review.

The community that nurtured, stimulated, and appreciated Brahms in his early adulthood included his fellow musicians. Robert and Clara Schumann created a family nexus that included Brahms. When Robert Schumann succumbed to mental illness and was tragically confined to an asylum, Brahms became a devoted companion to Clara Schumann and her seven children. Brahms marched to his own drummer. While Franz Liszt and Richard Wagner were enthralled with political and nationalistic mythologies, Brahms was dedicated to the concept of writing pure melody and the music of universal human emotions. In this endeavor, he was influenced by German folk songs, gypsy melodies, Jewish cantorial lamentations, and the popular music of the taverns where he spent much of his leisure time. His mother and Clara Schumann died at about the same time. Brahms' response was to compose A German Requiem as an expression of his grief. The emotional thrust of this requiem was not the concept of transcendence, but of endurance and consolation. In this sense, it was a precursor of the modern religious existentialist viewpoint. He wrote the text himself which he based on Martin Luther's translation of the Old Testament Psalms. It was ironical that this requiem created a deep appreciation of the Old Testament.

On the Centennial of the death of Johannes Brahms, in October 1996, the Berlin Philharmonic was in New York City to perform his symphonic works. Piano and violin soloists joined the philharmonic to play his great concertos written for these instruments. His choral works were highlighted in religious services during 1997.

We in the gifted community have a duty to discover and teach our students about the genius and creativity of Johannes Brahms, and the environment that encouraged his development.

1. Who were Brahms' mentors and teachers? Who were his greatest supporters and influences on his professional life?

2. What types of music did he study and use in his compositions?

3. How did the cultures of Hamburg, Germany and Vienna, Austria influence his work?

4. Why do classical music audiences still enjoy his music so much?

Toni Morrison (1931-): Winner of the Nobel Prize for Literature, 1993

This highly creative African American author was born and raised in the small industrial town of Lorain, Ohio, where she interacted with several immigrant groups including Italian, Polish and Jewish people. As a child, she was a voracious reader who was attracted to novels by Jane Austen and Leo Tolstoy. The humanism and compelling stories in Morrison's novels have emphasized the rich history, lives, and cultures of African American people and inspired readers around the world. Her greatest works are considered to be *The Bluest Eye* (1970), *Sula* (1973), *Song of Solomon* (1977), and *Jazz* (1992).

1. Did teachers and mentors in Lorain, Ohio stimulate her interest in literature and writing? If so, how?

2. How did her undergraduate years at Howard University and her work as an editor at Random House influence her writing?

3. What are some of the important influences of her writings on authors in the United States and other countries?

4. Why did the Nobel Prize Committee for Literature decide to recognize the work of this African American woman as being worthy of worldwide recognition?

Billie Holiday (1915-59): Blues and Jazz Singer

She was a dominant black singer during the swing and jazz eras from 1933 to 1956. Many of the luminaries of swing music such as Benny Goodman, Teddy Wilson, Duke Ellington, Count Basie and Artie Shaw included her on their bandstands. Her singing style was particularly influenced by Louis Armstrong and Bessie Smith. Holiday's unique contribution to popular music was her ability to render the harmonies and rhythms of the blues and jazz through her extraordinary vocal talent. She was a master of jazz improvisation. Some of the songs which she was noted for as a part of The Great American Song Book were "They Can't That Away from Me" (1937), "God Bless the Child" (1939), and "Good Morning Heartache" (1946). A few of the great swing and jazz singers who were strongly influenced by her style and genre were Ella Fitzgerald, Frank Sinatra, Diana

Krall and Diana Ross. "Lady Day" was admired by many outstanding jazz musicians such as saxophonist Lester Young, and pianist Teddy Wilson.

1. How did her difficult early life in Philadelphia, Baltimore and Harlem affect her musical development and career?

2. Who were her most significant mentors holding her in the highest esteem? How did they affect Holiday's career and creativity?

3. From studying her life and accomplishments, how can adversity serve as a motivator for high levels of creative production?

4. Identify a few minority individuals who experienced serious problems in growing up, and yet produced highly creative work in the arts, literature and other fields. What factors moved their creativity in a positive direction?

5. Why did she write the masterpiece, "God Bless the Child" (1939)? What aspects of creativity are involved in the writing and performance of this song?

6. How did Holiday's rendition of "Strange Fruit" (1939) increase awareness of racial hatred? What were the spiritual roots of her rendition?

Additional Discussions of Highly Gifted and Creative Individuals – Essays and Book Reviews from Gifted Education News-Page

Genius: The Life and Science of Richard Feynman **by James Gleick. Pantheon Books, 1992.**

This book describes the life and professional career of the Nobel Prize winning physicist, Richard Feynman (1918-88). It shows how far he went from humble lower-class beginnings in Far Rockaway Beach, New York in the 1920s and 1930s, to being a top undergraduate at the Massachusetts Institute of Technology, a doctoral student in physics at Princeton University (Professors John Wheeler and Albert Einstein were there too), one of the "young Turks" working on the World War II Atomic Bomb Project in Los Alamos, New Mexico, to becoming a professor of physics at Cornell University and the California Institute of Technology. The discussion of Feynman's early life is particularly interesting because it shows some of the crucial environmental factors that support early genius in science and mathematics. He was from a family and culture that placed a high value on learning and academic achievement, but neither his mother nor father had college degrees. Although his father was a salesman, he had an insatiable interest in science. He encouraged Richard to develop a similar interest by giving him various mathematics and scientific problems to solve, and helping his son to set up chemistry and radio wave experiments. Richard was a great tinkerer with radio sets; many times his mother would have to explain to friends the reasons for the puffs of smoke and explosions emanating from his bedroom. Both parents tolerated his home chemistry lab and scientific experiments in a culture that placed enormous pride in the academic accomplishments of its children.

There were no formal programs for the gifted during Richard's time in the public schools, but there were teachers who encouraged this student with an offbeat and flamboyant personality to participate in extra-curricular activities such as math-science clubs. In high school, he outshined all of his competitors in numerous math team competitions. He also had the self-motivation and chutzpa to begin studying the highly esoteric but essential principles of quantum mechanics while in high school. As a personality, Feynman was brash, outspoken, unorthodox and something of a comedian, all identifying characteristics cited by textbooks on giftedness. Because of his Jewish roots, he experienced discrimination at MIT and Princeton, but his enormous mathematical abilities and imagination overpowered the institutional discrimination that existed against Jews at these prestigious universities and in science-based industries. Gleick did a masterful job of presenting the life, personality and scientific achievements of this revolutionary physicist. This book is of particular interest to teachers and parents of gifted/creative science students, who would also find it exciting and inspirational.

Studying Outstanding American Poets to Learn about Their Unique Styles, Creativity and Choice of Subjects

Eight American Poets: An Anthology **by Joel Conarroe, Editor (1997). Vintage Books: New York.**

This is a wonderful selection by some of the nation's greatest and most creative modern poets. It includes the key poems of Elizabeth Bishop, James Merrill, Sylvia Plath, Allen Ginsberg, Theodore Roethke, John Berryman, Ann Sexton and Robert Lowell. The editor has written a brief biography of each poet's life that appears before his or her poems. These short biographies alone are very informative to those individuals interested in biographical studies of giftedness. For a variety of reasons, many of our best poets have experienced lives of deep conflict and tragedy. Conarroe organized an inspiring collection of 20th century poems that should delight lovers of poetry and admirers of the English language. Here is Theodore Roethke's poem, My Papa's Waltz, included in the book:

The whiskey on your breath
Could make a small boy dizzy;
But I hung on like death:
Such waltzing was not easy.

We romped until the pans
Slid from the kitchen shelf,
My mother's countenance
Could not unfrown itself.

The hand that held my wrist
Was battered on one knuckle;
At every step you missed
My right ear scraped a buckle.

You beat time on my head
With a palm caked hard by dirt,
Then waltzed me off to bed
Still clinging to your shirt.

Women of British Literature – Models of Creativity for Gifted Girls

Giftedness and Creativity as Represented Through an Array of 19th Century British Women Writers

> "In fact, the world is full of hopeful analogies and handsome dubious eggs called possibilities."
> -George Eliot (*Middlemarch,* 1872, p. 74, Bantam Books).

The contemporary gifted field is concerned with the concept of self-esteem. However, the trait that gifted individuals seek to attain is self-actualization and creativity, not self-esteem. The major contribution of Abraham Maslow (1998) to American psychology was his emphasis on the normal or super-normal individual as the criterion of human development. Prior to Maslow, studies of abnormal psychology were used as indicators of the dynamics of human personality. The self-actualizing individual is one who is striving to perform and achieve full cognitive and creative potential. These individuals also possess to a larger extent, more holistic and personal constructs – they function at the higher levels of the cognitive and emotive realms.

In the 19th century, England produced a startling array of women who were literary self-actualizers. They included Jane Austen (1775-1817), Charlotte Brontë (1816-55), Emily Brontë (1820-49), Elizabeth Barrett Browning (1806-61), and George Eliot (1819-80). They wrote creative masterpieces that have become a part of the literary imagination of the English speaking world. Examples of these masterpieces are: *Pride and Prejudice* (1813) by Jane Austen, *Jane Eyre* (1847) by Charlotte Brontë, *Wuthering Heights* (1847) by Emily Brontë, *Sonnets from the Portuguese* (1850) by Elizabeth Barrett Browning, and *Middlemarch* (1872) by George Eliot. Besides the novels themselves, it is especially their style and characters that linger in our psyches. They had a major impact on both English and world literature.

It is important for those in the gifted field to study the lives and literature of these great women writers, not only for insights into the development of gifted women but also for understanding giftedness and creativity in general. What stands out in all of their books is their high levels of sensibility. Despite their lack of formal higher learning, they were all self-educated individuals. All of them were artistically creative at an early age (e.g., Jane Austen wrote her great novels in her early 20s). There is abundant evidence that they were intellectually acute and curious early in their lives (Elizabeth Barrett Browning learned Latin and Greek at home before she was twelve years old). All of them were serious linguists (George Eliot was one of the most important translators of German into English). She translated such philosophical works as Ludwig Feuerbach's *The Essence of Christianity* (1841) which had a major influence on Christian ethics. All of them were social critics and keenly analytical (in their novels) concerning such issues as feminism, and the role of class and religious bigotry in their society.

They are important models for gifted students and represent how the gifted sensibility transcends the social parameters of gender and class. Their self-esteem is derived from the process of self-actualization as expressed through the creative and human spirit.

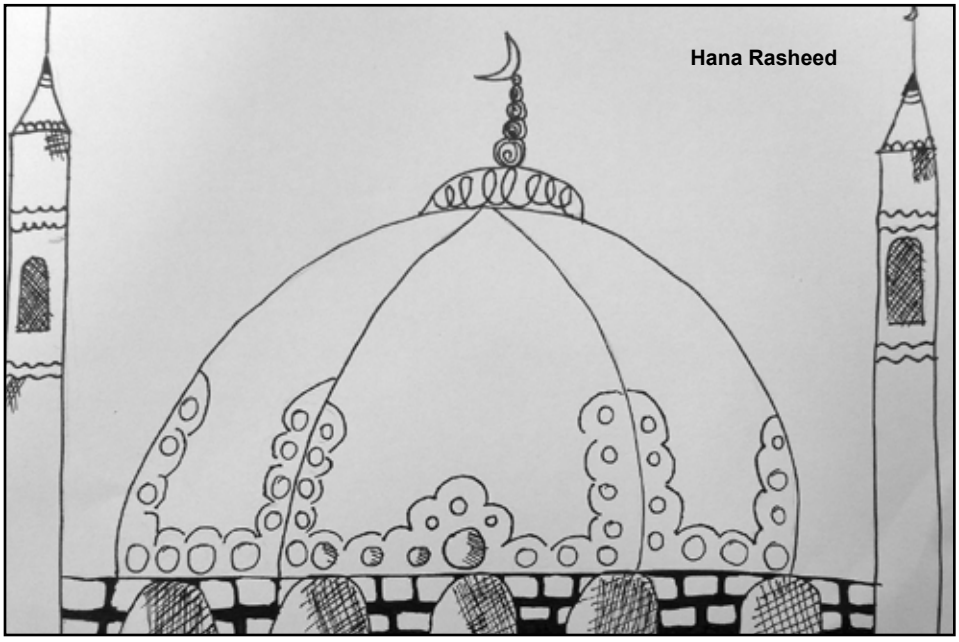
Stuart Little by E.B. White: A Tale for Stimulating the Curiosity and Imagination of Young Gifted Children

"I originally did a draft that was basically a faithful version of the book. The general response from the studio was, wow, it's so literate,. . ."
M. Night Shyamalan, Director of the movie version of *Stuart Little* (*The New York Times*, Dec. 25, 1999, p. C24).

Enrichment and cognitive stimulation are the main ingredients for the development of the young gifted child. It is interesting that we now have an opportunity to observe the impact of and differences between the cinematic and literary versions of a classic children's tale, *Stuart Little* (1945) by E.B. White. I (Walters) presented both versions to a group of primary level gifted children. Interestingly, their preference was clear-cut. Despite the ideas of many experts on the immersion of children in electronic media such as television, video and the movies, most of the children preferred the literary-book format.

It obviously helps when a tale is written by a creative genius such as E.B. White (1899-1985). In addition, the version of *Stuart Little* published by Harper-Collins in 1973 is splendidly presented in both the hard and paperback editions. The illustrations are by Garth Williams who also illustrated the other two classics of children's literature by E.B. White – *Charlotte's Web* (1952) and *The Trumpet Of The Swan* (1970). These pictures have a magical quality and are an integral part of the narrative. It is the narrative that shows White's creative genius since he allows the reader to achieve what Edgar Allan Poe called, "the suspension of belief." During the entire story, my primary level gifted students viewed Stuart Little as being one of their peers. This is a modern fable of excitement, wonderment, anxiety, courage and love. It is precisely these sentiments that heighten the cognitive stimulation, creativity and enrichment which young gifted students need and seek.

The most impressive result of their reading *Stuart Little* is that they spontaneously wanted to produce their own story books about this mouse, creating new adventures from their imagination. The children said they found the movie version to be fun but not as exciting and interesting as the book. My recent encounter with this story should lead to serious research comparing well-crafted books with their translations into movie, video and television formats. Why young gifted children appear to prefer a well-written book should provide more understanding of the role of sensibility in giftedness.



Highly Gifted and Creative Individuals to Consider for Further Study

Classical Music Composers
(Examples):
Johann Sebastian Bach, Ludwig Van Beethoven, Johannes Brahms, Gustav Mahler, Wolfgang Amadeus Mozart, Igor Stravinsky, Dmitri Shostakovich, Pyotr Ilyich Tchaikovsky

Classical Music Conductors

Gustavo Dudamel. Los Angeles Philharmonic Music Director

Lorin Maazel. Conductor, Music Educator, Founder of the Castleton Festival in Castleton, Virginia

Michael Tilson Thomas. Conductor of the San Francisco Symphony and New World Symphony (an orchestral academy for gifted youth)

Classical Music Performers

Joshua Bell. Violinist. His performances on his 300 year old Stradivarius are noted for the rich tones and lush interpretations he evokes from this instrument. Bell recorded an album entitled *The Romance of the Violin* (2003) which sold about 5,000,000 copies

Alfred Brendel. Pianist. He was particularly associated with the works of Haydn, Beethoven, Schubert and Mozart.

Jascha Heifetz. Violinist and teacher. One of the greatest violinists of all time noted for his exemplary technique and teacher of outstanding young violinists, Heifetz placed strong emphasis on the fundamentals of violin playing.

Vladimir Horowitz. Pianist. He was best known for his Romantic interpretations of Chopin, Liszt, Rachmaninoff, Schubert, and Scriabin.

Franz Liszt. Pianist, composer, and teacher. An extraordinary performer idolized by fans and prolific composer of dramatic piano pieces, he also invented and conducted symphonic poems.

Itzhak Perlman. Violinist, conductor, and teacher. Perlman was stricken with polio at a young age, but this did not deter his growth and achievement as a musician. He and his wife have both done significant work in educating talented youth.

Arthur Rubinstein. Pianist. He was one of the greatest pianists of the 20th century, an outstanding interpreter of Chopin's music.

André Watts. Pianist. He became an expert on 19th century music with particular emphasis on Franz Liszt's works, and had a showmanship and technical proficiency similar to Liszt. Watts was also a champion of Beethoven's and Chopin's piano music.

Cognitive Theorists

Mihaly Csikszentmihalyi. Originated Flow Theory, Claremont Graduate University

John Dewey. United cognitive learning processes with human activity

Howard Gardner. Designed the theory of multiple intelligences, Harvard University

Jean Piaget. Originated the theory of cognitive development – genetic epistemology

Robert Sternberg. Designed the triarchic model of intelligence, Cornell University

Computer Innovators

Steve Jobs and **Steve Wozniak**, Founders of Apple Computer

Alan Turing. Designed basic concepts of computer processing and computer science

Dancers and Choreographers

Fred Astaire and **Ginger Rogers**. Actors and choreographers, famous for their Hollywood musicals

George Balanchine. Choreographer and Co-founder of School of American Ballet

Agnes de Mille. Choreographer for such famous works as *Rodeo* (Aaron Copland) and *Oklahoma!* (Rodgers and Hammerstein), and many other Broadway musicals

Martha Graham. Developer of modern dance who performed for over 70 years and greatly influenced dance in America and other countries

Judith Jamison. African American dancer who is Director and Choreographer of Alvin Ailey American Dance Theater

Gene Kelly. Actor, singer, film director, producer, and choreographer, noted for his energetic dance performances in Hollywood movies

Film Producers

Ken Burns. Concentrates on historical subjects such as the American Civil War and baseball

Walt Disney. Produced outstanding film documentaries and feature movies for children

James Burke. Developer of the "Connections" concept.

Humorists and Comedians

Bud Abbott and **Lou Costello**. Made great movie comedies related to current and historical events (e.g., *Abbott and Costello Meet Captain Kidd,* 1952).

Lucille Ball. Started the original television comedy series, *I Love Lucy,* and organized one of the most successful TV production companies, Desilu Productions.

Jack Benny. Master of radio and TV comedies

Milton Berle. Pioneered television comedy with the *Texaco Star Theater* (1948–55) and known for his wild skits, high energy and extraordinary ad-libs.

Sid Caesar. Most creative TV comic of our times; his *Show of Shows* (1950-54) was the penultimate comic television show at a time of live broadcasts.

Dick Gregory. African American civil rights activist, writer, and comedian; satirized situations related to racial prejudice and became a powerful comedic voice on behalf of the civil rights struggle.

Bob Hope. Known for his popular and now classic one-liners, as well as his road movies with Bing Crosby.

Garrison Keillor. Author; Originator and Host: *A Prairie Home Companion.*

Jack Lemmon and **Walter Matthau**. Created high comedy within serious social situations.

Jerry Lewis. Television performer, movie actor, director; represented the modern day Charlie Chaplin.

Marx Brothers (Groucho, Chico, Harpo, and Zeppo). Zany team of comedians who played in *Animal Crackers* (1930), *Duck Soup* (1933), *A Night at the Opera* (1935), *A Day at the Races* (1937) and so forth.

Neil Simon. Comic playwright who makes people laugh and cry at the same time through such outstanding creations as, *The Odd Couple* (1968), *The Sunshine Boys* (1972), and *California Suite* (1976).

Red Skelton. Great satirist, pantomimist, and humorist whose repertoire of characters became a spotlight on the American people.

Mark Twain. Satirist, author, essayist, lecturer, and creator and performer of one-man shows

Internet Innovators

Tim Berners-Lee. World Wide Web inventor

Jeff Bezos. Developed sophisticated methods for selling books and other products online.

Vint Cerf. Internet and email pioneer

Jack Dorsey. Founder of Twitter

Larry Page and **Sergey Brin**. Founders of Google and developers of Google search engine

Jimmie Wales. Co-founder of Wikipedia

Mark Zuckerberg. Founder of Facebook

Jazz Musicians and Composers

Louis Armstrong. Jazz trumpet player who combined performance with vocal and small ensemble innovations and served as a model and inspiration for jazz musicians.

Duke Ellington. Innovative band leader and jazz composer

George and **Ira Gershwin.** Pioneers of jazz and musical composition

Benny Goodman. Swing clarinetist and big band leader

Wynton Marsalis. Trumpet player and Director of the Jazz at Lincoln Center Orchestra, New York City

Charles Mingus. Double bass player, composer, and bandleader

Artie Shaw. Swing clarinetist and big band leader

Jazz and Popular Singers

Tony Bennett. Sings show tunes, popular standards, and jazz, and has been performing since the 1950s.

Rosemary Clooney. Jazz singer who performed catchy tunes that stayed in listeners' minds.

Nat King Cole. Known for having the most silky, vibrant, and melodic voice of any popular singer (e.g., *Mona Lisa*); one of the first African Americans to host a TV show.

Harry Connick, Jr. New Orleans jazz popular singer and pianist; also played in Hollywood Movies (e.g., *Memphis Belle,* 1990).

Bing Crosby. Greatest crooner of the 20th century

Doris Day. Started singing in big bands in 1939 and appeared in numerous movies (e.g., *Young Man with a Horn,* 1950, with Kirk Douglas and Lauren Bacall, and *Love Me or Leave Me,* 1955, with James Cagney

Michael Feinstein. Music educator; interpreter of the Great American Songbook.

Ella Fitzgerald. Called "The First Lady of Song" and interpreted much of the Great American Songbook; became the most popular jazz singer for over half a century.

Lena Horne. Had a singing and acting career of more than 70 years in film, television, and Broadway; noted for her rendition of *Stormy Weather* (1933).

Al Jolson. Dynamic vaudeville and movie singer and performer; appeared in first talkie movie (*The Jazz Singer,* 1927); famous for a number of songs (e.g., *My Mammy,* 1918, *Rock-A-Bye Your Baby with A Dixie Melody,* 1918, *Swanee,* 1919, *California, Here I Come,* 1924).

Elvis Presley. Worldwide entertainer; brought Rock-and-Roll to the forefront of American popular music.

Frank Sinatra. Dynamic singer of lyrical expression and movie actor; sold about 150 million records worldwide with such notable songs as, *Strangers in the Night* (1966), *My Kind of Town (Chicago Is)* (1964), and *My Way* (1969).

Literature and Poetry

Saul Bellow. Nobel Prize winner in literature. His best known works were *The Adventures of Augie March* (1953), *Seize the Day* (1956), *Henderson the Rain King* (1959), *Herzog* (1964), *Mr. Sammler's Planet* (1970), *Humboldt's Gift* (1976) and *Ravelstein* (2000).

Jorge Luis Borges. Argentinian poet and fiction writer of enormous depth and imagination. Best known works are *Ficciones* (1962) and *El Aleph* (1949).

Geraldine Brooks. Pulitzer Prize winner, noted for her book, *People of the Book* (2008), a story about the disappearance of the Bosnian (Sarajevo) Haggadah used in Jewish Passover Seders.

Emily Dickinson. New England poet who mastered the art of turning thought into beauty.

Annie Dillard. Pulitzer Prize winner for *Pilgrim at Tinker Creek* (1974); outstanding nature writer, fiction writer and author of books on writing.

Rita Dove. Pulitzer Prize winner, poet and professor, University of Virginia. Themes of her poetry reflect the true sense of multiculturalism and a wide range of cultural and intellectual interests.

William Faulkner. Nobel Prize winner in literature. Major works were *The Sound and the Fury* (1929), *Absalom, Absalom!* (1936), and *The Reivers* (1962).

F. Scott Fitzgerald. Author whose writings reflected the Jazz Age. Outstanding books were *This Side of Paradise* (1920), *The Beautiful and Damned* (1922), *The Great Gatsby* (1925), and *Tender Is the Night* (1934).

Ernest Hemingway. Nobel Prize winner in literature. *The Sun Also Rises* (1926), *A Farewell to Arms* (1929), *For Whom the Bell Tolls* (1940), and *The Old Man and the Sea* (1951).

Khaled Hosseini. Author of novels about Afghanistan; medical doctor.

Gabriel García Márquez. Nobel Prize winner in literature. South American author, famous for his magic realism as shown in *One Hundred Years of Solitude* (1967).

Larry McMurtry. Pulitzer Prize winner. Author of novels about cowboys and the American West; bookseller.

N. Scott Momaday. Pulitzer Prize winner in 1969. Native American author who received the National Medal of Arts in 2007.

Czesław Miłosz. Polish poet and prose writer as well as Nobel Prize winner in literature, known for political and anti-communist poems. Used a lyrical-dramatic style to make readers aware of repressive governments; member of the Polish underground during World War II where he helped many Jewish people escape from the Nazis. *The Captive Mind* (1953) is his most famous book.

Pablo Neruda. Nobel Prize winner in literature. Great lyrical poet from Chile known for his historical, nature, and love poems. Many of his odes are highly imaginative and humorous.

Mary Oliver. Pulitzer Prize winner, nature poet and poetry teacher

John Updike. Pulitzer Prize winner, whose novels concentrated on the lives and loves of middle class Americans. His popular Rabbit series included five novels (1960-2000); essayist and poet well known for his superb writing style.

Robert Penn Warren. Pulitzer Prize winner for his book, *All the King's Men* (1946); also received the Pulitzer for poetry in 1958 and 1979.

Medicine and Biology

Ben Carson, MD. Director of pediatric neurosurgery (retired) at The Johns Hopkins University Medical Center; author.

Charles Darwin. Originator of the theory of evolution

Jane Goodall. Primatologist noted for her studies of chimpanzees in the wild

Sherwin Nuland. Surgeon, medical historian; author of *Doctors: The Biography of Medicine* (1988), *How We Die: Reflections on Life's Final Chapter* (1994), *Maimonides* (2005), and *The Art of Aging: A Doctor's Prescription for Well-Being* (2007).

Louis Pasteur. French scientist who developed vaccines for rabies and anthrax, conducted research that supported the germ theory of disease, and invented a method for killing bacteria in milk and wine—pasteurization.

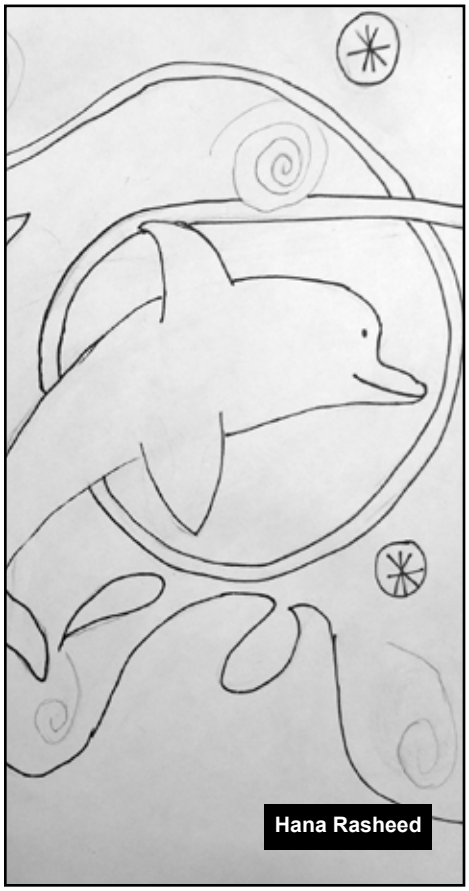
V.S. Ramachandran. Neuroscientist and brain researcher; best-selling author of *Phantoms in the Brain: Probing the Mysteries of the Human Mind* (1999), *A Brief Tour of Human Consciousness: From Impostor Poodles to Purple Numbers* (2005), and *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human* (2012).

Oliver Sacks, MD. Neurologist and best-selling author of *The Man Who Mistook His Wife for a Hat: And Other Clinical Tales* (1998), *Awakenings* (1999), *Musicophilia: Tales of Music and the Brain* (2008), and *Hallucinations* (2013).

Jonas Salk. Medical researcher who developed the first effective polio vaccine, founded the Salk Institute for Biological Studies in 1960.

James Watson and **Francis Crick.** Nobel Prize winners in physiology or medicine in 1962; discoverers of the DNA molecule.

Edward O. Wilson. Harvard University biologist, founder of sociobiology, and world renowned entomologist and expert on ants. Pulitzer Prize winner two times; has written many fascinating books including *Consilience: The Unity of Knowledge* (1998), *The Social Conquest of Earth* (2013), *Letters to a Young Scientist* (2014), and *The Meaning of Human Existence* (2014).



Movie Actors and Actresses

Lauren Bacall. Known for her enticing voice and good looks; starred in several movies with Humphrey Bogart such as *The Big Sleep* (1946), *Dark Passage* (1947), and *Key Largo* (1948).

Humphrey Bogart. Superb character actor in such films as *Maltese Falcon* (1941) and *Casablanca* (1942).

Kirk Douglas. Versatile actor who performed in a range of films including *Young Man with a Horn* (1950) and *Lust for Life* (1956), and *Spartacus* (1960).

Henry Fonda. Famous for his roles in *The Grapes of Wrath* (1940) and *Mister Roberts* (1955).

Judy Garland. Starred in *The Wizard of Oz* (1939) and *Meet Me in St. Louis* (1944), among many other films.

Katharine Hepburn. Had a long career of quality movie acting from *Little Women* (1933) to *The African Queen* (1951) to *Guess Who's Coming to Dinner* (1967).

Charlton Heston. Was in 100 films over 60 years. Examples include *The Ten Commandments* (1956), *Ben-Hur* (1959), El Cid (1961), *The Agony and the Ecstasy* (1965), and *Planet of the Apes* (1968).

Helen Mirren. Highly accomplished stage and screen actress; has extraordinary depth and range, as seen in films such as *The Queen* (2006), and *Woman in Gold* (2015).

Shirley Temple. Child actress who played in *The Little Colonel* (1935) and *Heidi* (1937).

Denzel Washington. Starred in the 1992 film, *Malcolm X,* among many other movies.

Movie Directors

Frank Capra. Director of such classics as *It Happened One Night* (1934), *You Can't Take It With You* (1938) and *Mr. Smith Goes to Washington* (1939).

Charlie Chaplin. Directed *Modern Times* (1936) and *The Great Dictator* (1940).

Michael Curtiz. Director of the outstanding film, *Casablanca* (1942).

Victor Fleming. Director of *The Wizard of Oz* (1939) and *Gone with the Wind* (1939).

John Ford. Directed *The Grapes of Wrath* (1940) and movies about the West (e.g., *Fort Apache,* 1948)

Alfred Hitchcock. "The Master of Suspense;" great mystery film director of such classics such as *North by Northwest* (1959) and *The Birds* (1963).

John Huston. Directed a wide range of movies from *The Maltese Falcon* (1941) to *The Treasure of the Sierra Madre* (1948).

Angelina Jolie. Director of the 2014 film, *Unbroken.*

Vincente Minnelli. Director of such movie musicals as *An American in Paris* (1951) and serious works such as *Lust for Life* (1956) about the creative agony of *Vincent van Gogh*.

Steven Spielberg. Concentrates on making films of great historical and emotional depth – *Jaws* (1975), *E.T. the Extra-Terrestrial* (1982), *Schindler's List* (1993) *Jurassic Park* (1993), and *Saving Private Ryan* (1998).

Orson Welles. Director of classic American films including *Citizen Kane* (1941) and T*he Magnificent Ambersons* (1942).

Billy Wilder. Famous for his film noir rendition of *Double Indemnity* (1944) and for *The Lost Weekend* (1945). Later films were mostly comedies – *The Seven Year Itch* (1955), *Some Like It Hot* (1959), and satires such as *The Apartment* (1960).

William Wyler. Three of his best films won Academy Awards – *Mrs. Miniver* (1942), *The Best Years of Our Lives* (1946), and *Ben-Hur* (1959).

Opera Singers

Marian Anderson. African American opera singer (contralto) who made history in 1939 when she sang at the Lincoln Memorial before a crowd of 75,000; one of the most celebrated singers of her time, she mainly performed in concerts and recitals.

Andrea Bocelli. Blind classical tenor particularly noted for his recordings that have sold over 75 million copies.

Renée Fleming. Lyric soprano noted for a wide ranging repertoire that includes operas by Strauss, Mozart, and Handel; also performs jazz and popular music.

Marilyn Horn. Mezzo-soprano who specialized in powerful roles of beauty and great challenge.

Plácido Domingo. Spanish tenor who sings a wide variety of roles from Wagner to Rossini and Bizet; conductor and opera producer.

Luciano Pavarotti. Noted for his singing in bel canto operas and works by Puccini; also sang popular music; one of The Three Tenors.

William Caesar Warfield. African American bass-baritone who was famous for his role in *Porgy and Bess*; also noted for his acting and poetry recitals.

Philosophers

Alfred Adler. Applied Aristotle's philosophy to American society; founder of The Great Books; college and public school educator.

Martin Buber. Originator of the I-Thou concept of human interactions; theologian.

Albert Camus. Concentrated on human struggle, tragedy and endurance; critic of totalitarianism on both the left and right.

Daniel Dennett. Philosopher of mind; author of *Intuition Pumps and Other Tools for Thinking* (2013).

Ralph Waldo Emerson. Founder of Transcendentalist movement

Rebecca N. Goldstein. Author of *Plato at the Googleplex: Why Philosophy Won't Go Away* (2014)

William James. Philosopher and psychologist; one of the founders of pragmatism.

Colin McGinn. Philosopher of mind. Author of *The Mysterious Flame: Conscious Minds in a Material World* (1999).

George Orwell. Critic of totalitarianism; author and essayist; analyst of political language.

Henry David Thoreau. Nature writer; advocate of the philosophy of self-sufficiency.

Physicists and Astronomers

Sean Carroll. Professor of particle physics, California Institute of Technology

Marie Curie (Poland and France). First woman scientist to win a Nobel Prize in Physics (1903); won a second Nobel Prize in Chemistry (1911); studied the effects of radioactivity.

Albert Einstein. Revolutionized physics; developed theories of relativity.

Brian Greene. Professor of physics and mathematics, Columbia University

Edwin Hubble. Known as one of the greatest observational astronomers of the 20th century demonstrating that there are other galaxies besides the Milky Way and that the universe is expanding at an accelerated rate.

Sir Isaac Newton. Developed laws of motion; postulated gravity; invented calculus.

Robert Oppenheimer. Nuclear physicist with many outstanding theoretical and research achievements; leader of the Los Alamos Atomic Bomb project.

Lisa Randall. Professor of physics, Harvard University; specialist in particle physics and cosmology.

Neil deGrasse Tyson. Director of the Hayden Planetarium, New York City

Sculpture

Deborah Butterfield. Master of the horse.

Software Developers

Bill Gates and **Paul Allen**. Microsoft Corporation.

Technology Innovators

Thomas Edison. Inventor of the light bulb, phonograph, and movie camera.

Dean Kamen. Entrepreneur and inventor of the Segway Personal Transporter.

William Shockley, John Bardeen and **Walter Houser Brattain.** Inventors of the transistor.

Nikola Tesla. Engineer and physicist; made significant contributions to the design of alternating current.

Wright Brothers. Systematically studied the principles of flight; made first airplane flights in the United States.

Concept of Synergy as a Major Factor in Creativity

Walt Disney Pictures was in the forefront of cinematic innovation using a uniquely American art form, the animated feature film. I (Walters) took students who were in a special summer enrichment program that combined photography with English language acquisition to see Disney's *The Lion King*. Although this enrichment program was designed to improve their English language skills, they were attracted by the Disney-like synergy of photography, reading and writing. Many of them were in fact gifted. As I observed during the movie and afterwards, the more gifted students were particularly stimulated by this film's synergy (i.e., the combination of the visual effects of animation and color, music and sound, narrative flow, plot and characterization). They experienced a complex range of emotions and cognitive insights regarding the story. Disney has a tradition of using synergy in its movies from *Snow White and the Seven Dwarfs* (1937) to *Pinocchio* (1940), *Fantasia* (1940), *Dumbo* (1941), *Bambi* (1942), *Cinderella* (1950), *Lady and the Tramp* (1955), *Jungle Book* (1967), *Beauty and the Beast* (1991), and *Aladdin* (1992). *The Lion King* reflects a mythic consciousness that has a universal appeal and unique qualities of its own. It was no accident that a gifted individual such as Leopold Stowkowski (1882-1977), a highly respected symphonic conductor, worked closely with Walt Disney (1901-66) to achieve *Fantasia's* synergy. Gifted students will thoroughly enjoy this most recent expression of Disney's synergy. *The Lion King* roars and the gifted child's creativity and sensibility respond to it!

Creative Collaboration

What factors lead to highly productive groups? What types of individuals make the best leaders for organizing and directing these groups? Warren Bennis (1997), a Distinguished Professor of Business Administration at the University of Southern California, and Patricia Ward Biederman (1997), a feature writer for the Los Angeles Times, provided informative answers to these questions based on their intensive study of seven "Great Groups" – the Walt Disney studio that produced such classics as *Snow White and the Seven Dwarfs* and *The Lion King;* the Computer Science Laboratory at the Palo Alto Research Center (PARC) of Xerox Corporation (developers of the first personal computer); the Apple Computer team that expanded PARC's concepts into the Macintosh computer; the 1992 Clinton presidential campaign team; the Skunk Works group at Lockheed Corporation (designed the first U.S. jet fighter near the end of World War II, the U-2 long-range aircraft, and the Stealth fighter-bomber); the professors and artists who founded Black Mountain College; and the scientists who produced the Atomic Bomb in the Manhattan Project.

To learn how these groups operated, the authors interviewed hundreds of former participants and other people associated with them.

> ***All seven groups are great in several senses. Each was or is made up of greatly gifted people. Each achieved or produced something spectacularly new, and each was widely influential, often sparking creative collaboration elsewhere. . . . (p. 4).***

> ***We chose our seven Great Groups to underscore the range of fields, including education, in which creative collaboration can take place. We also picked these seven because each makes a fascinating story. Vibrant with energy and ideas, full of colorful, talented people playing for high stakes and often racing against a deadline, Great Groups are organizations fully engaged in the thrilling process of discovery. . . . (p. 7).***

There are many useful lessons here for educators of the gifted concerning the organization of group work by highly gifted individuals. All of these lessons converge on the issue of cooperative learning is currently practiced in today's classrooms. From gleaning the major points of *Organizing Genius* (1997), it can be concluded that cooperative learning can be effective for groups of similarly gifted and creative students when they are encouraged to function in a dynamic and innovative classroom. But, they must work with other students of similar high abilities under creative leadership for cooperative learning to have a positive influence on their lives.

To understand this conclusion, it is necessary to study Bennis and Biederman's findings which are discussed in their first two chapters ("Introduction" and "The End of The Great Man").

> ***. . . Groups become great only when everyone in them, leaders and members alike, is free to do his or her absolute best. This book is about organizing gifted and creative people in ways that allow them both to achieve great things and to experience the joy and personal transformation that such accomplishment brings. In today's Darwinian economy, only organizations that find ways to tap the creativity of their members are likely to survive" (p. xvi).***

Although the myth of the lone leader dominates American culture, the reality is that many outstanding accomplishments in modern society involve great talents coalescing around a great leader (e.g., Steve Jobs at Apple Computer, and Robert Oppenheimer in the Manhattan Project). This principle can be seen in many different areas of human attainment, for example, in the Bauhaus School in Architecture, the Guaneri String Quartet, the Duke Ellington Band, the New York Philharmonic, developments in technology, and advancements in medical science. A great leader is usually necessary for a Great Group to reach its goals – the authors believe that the future success of industry will be based on identifying and nurturing this dynamic combination of gifted individuals (p. 3). Bennis

and Biederman also stress that artists and writers organize themselves into Great Groups. Thus, Michelangelo trained and supervised a working group of 13 talented artists to help him paint the Sistine Chapel. The French impressionists (Monet, Manet, Degas, and Renoir) engaged in a synergistic artistic relationship. And groups of writers and artists in England (Bloomsbury group) and America (Algonquin Round Table) provided each other with a stimulating environment for promoting creative literary and artistic achievements.

From their study of the seven groups discussed, the authors of this book identify some commonalities to assist educators of the gifted in establishing exciting and productive classroom groups: (1) Each group included in *Organizing Genius* (1997) had extraordinary leaders with a keen eye for identifying talent; (2) the participants were almost always young – about 25 years; (3) many of the group members were playful and mavericks in their fields; (4) they demonstrated the "delusional confidence" of youth which fueled the group to accomplish what was originally thought to be impossible; (5) the members were tinkerers and very curious; (6) they would spend hours pursuing problems or trying to figure out how something works; and (7) they had hungry, urgent minds. The extraordinary leaders of these Great Groups understood that people are motivated by solving meaningful problems, and that they must guide the dream of greatness (the central theme of all Great Groups). They were skilled at identifying the right person for a particular job, and encouraging independence among all members of their group.

This well-written book contains an amazing summary (within only 239 pages) of the workings of highly gifted groups. The story of these groups can help educators of the gifted to organize authentic and dynamic cooperative learning environments in their schools and classrooms.

Conclusion

Each era in world history has produced highly gifted and creative individuals from many different nationalities and cultural groups. The final products of their creativity vary according to cultural, economic, political and social needs. In the United States, citizens are blessed with a nation that encouraged innovation and creative thinking since its founding. Today, the fruits of this democratic society and open political system resulted in such outstanding achievements as NASA's space program, the Hubble Space Telescope, nuclear energy, new discoveries in particle physics, and advances in medical sciences, personal computers, the Internet, iPads and iPhones. What the future of creative production holds goes far beyond current predictions. This is why educators should intensively study the creative process and exemplars of this process to effectively prepare students for a future with innovation and high levels of creativity in the United States and the world.

Today there are many media sources encouraging the development of creativity among children and youth. For example, Christopher O'Riley's popular NPR radio show (*From the Top)* selects outstanding young musicians to perform before a national audience. Another example is the *Disney Dreamers Academy* that encourages young people to prepare for high achievements in professional fields. The key attributes of candidates should be:

• Intellectually curious – Creative and quick-witted

• Compassionate – Gives to others who need their assistance

• Courageous – Overcomes obstacles, brave, spirited, survivor

• Leader – The "go-to" person, pursues ideas with passion

More opportunities like these need to be offered to talented and creative youngsters.

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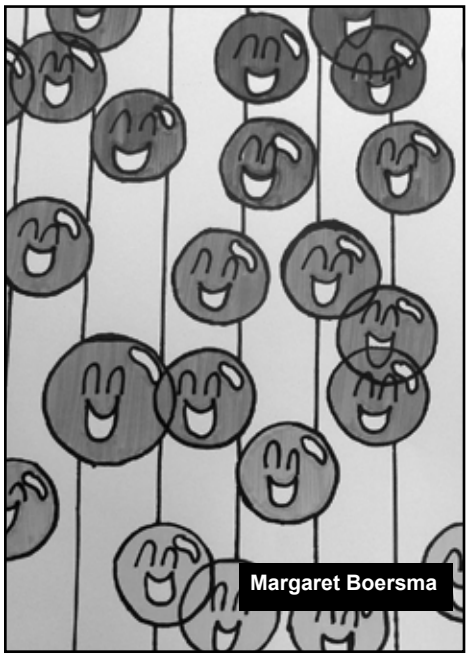
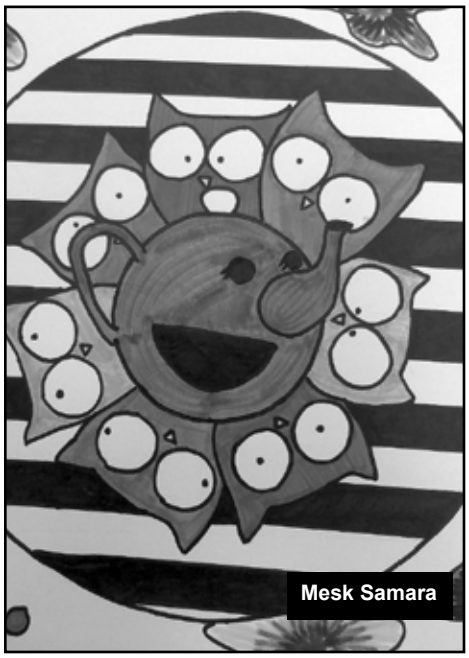




The (Creative) Power of Choice

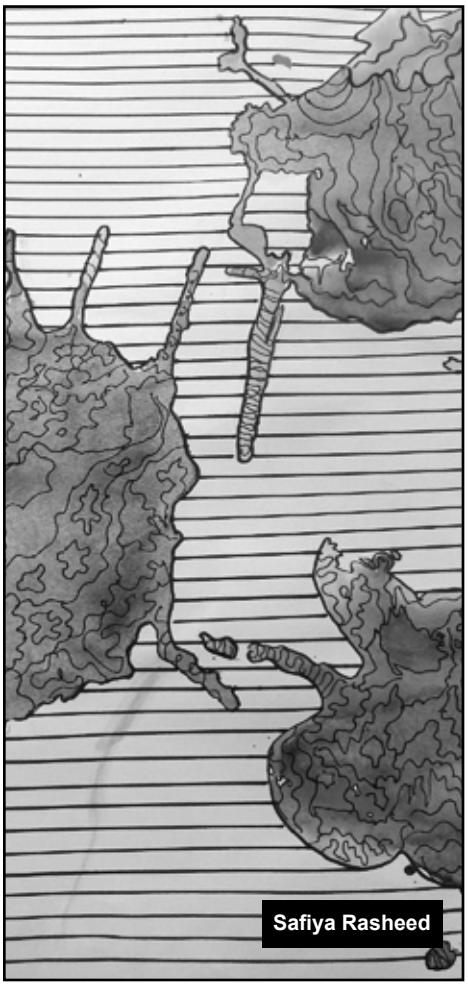
by Nan E. Hathaway

Programming designed to promote creativity requires a philosophy that defends learners' requirements for time, space and choice, three elements that are in short supply in today's schools (Jaquith, 2012). Eleanor Duckworth in The Having of Wonderful Ideas recalls, "In my entire life as a student, I remember only twice being given the opportunity to come up with my own ideas, a fact that I consider typical and terrible" (2006, p. 125). I hope things have changed meaningfully in support of creativity and innovation since the time she was in school, but I know that schools and schooling can be very slow to change. Teachers seeking creative outcomes for their students need to consider how they can re-imagine time and space within the confines of the school day and look for ways to offer authentic choices for their increasingly diverse groups of learners.

In a recent district-wide professional development day for teachers, Katie Novak used an analogy of hosting a dinner party to illustrate considerations for planning curriculum for today's learners. Her party included guests who had different eating needs and preferences to illustrate the challenges of teaching a diverse group of students (Novak, 2015). At Novak's party, there was a guest who is a vegetarian, another who is vegan, one with gluten intolerance, another with a nut allergy, in addition to those counting calories. In her scenario, a special dish could be created for each guest in an attempt to suit individual need and taste. At this party, the host is deciding, in advance, which guest will eat each dish. But what if the beet salad made for the vegan guest doesn't account for the fact that this guest had beet salad for lunch, or the macaroni and cheese won't suit the vegetarian guest because she cannot tolerate cheese? Instead, Novak suggested making a wide variety of dishes and letting her guests choose what they will eat. This is well and good. I am all for student choice which can be an important teaching component to engage and meet the needs of diverse groups of students. But I don't think this goes quite far enough. It's not sufficient or always possible for teachers to make all the food and have students just show up when it's time to eat!

You do not know me, but if you did, you would not be surprised that as Katie Novak was completing her dinner-party illustration, I raised my hand from the back row and asked, "What if you made it a pot-luck?" The distinction, of course, is that if each guest brings a dish to share, not only will there will be something for everyone to eat, but all guests will be introduced to the tastes of others in the group and contribute to making the party a success. What if this is how contemporary classrooms are designed? I once heard a student lament, "Every day I come to school with great ideas in my head, and no time in school to paint them." I fear that teachers are so focused on providing learning experiences to meet all their students' needs that they may unwittingly leave their students out of the process. This is a disservice to all students to be sure, but for gifted, creative learners, it may be a deal-breaker. On the other hand, content differentiated by the student, not the teacher, is the way to guarantee relevant, personalized learning. Student-initiated differentiation in a mixed-ability classroom can provide an education flexible enough to engage children on both ends of the spectrum while providing gifted, creative learners a program without bounds.

Gifted, creative learners typically develop idiosyncratic interests, often "falling in love" (Torrance, 2002, p. 30) with a particular subject, persistent idea, or engaging process. E. Paul Torrance, researcher, teacher, mentor, and champion for creative individuals, "on a quest to discover the secrets of creativity" (Cramond, in Torrance, 2002, p. vii) was convinced that falling in love with one's work is an essential ingredient in creative engagement, the kind that leads to vital "new solutions and achievements" (p. 31). Cheerfully offering a once-a-year "independent project" does not meet the daily hunger creative children must endure when the rest of their yearly menu is prescribed. Yet in many cases this annual independent project is the most that is offered children in the name of personalized learning.



Safiya Rasheed

The Learner-Directed Studio-Classroom

I have already disclosed that I am the wise-guy in the back of the auditorium who calls out provocative questions and interrupts the speaker's flow. Now I will disclose that I am also an art teacher with a specialty in gifted education. I am every bit as much a learner as I am a teacher. One thing I have learned from my students is that in order to thrive, they need time and space. These are two things modern schools rarely offer; scheduling is often so tight that little ones barely have time to finish their lunch. But for reasons I do not need to delineate here, the art room can operate a little differently from the rest of the school. So, given a license to be creative, art educators can experiment a little with how they use both time and space. While usually still locked into 45-minute periods, an art program can begin to function less like a school classroom and more like a community art studio. Students can assume the role of artists and have their time reallocated to preserve as much as possible for making art. The concept of Teaching for Artistic Behavior (TAB), or Choice-Based Art Education, is a grassroots movement supporting learner-directed art education. What I have learned from my Choice-Based practice can, I believe, inform educators in all fields to reconsider the use of time and space to better suit the needs of children. In this construct, the roles of teacher and student shift and a new balance of structure and support emerges in which the learner's ideas, needs, and interests are honored and supported in an authentic, organic manner. Here, the agenda for learning is negotiated between teacher and learner based on observed need, student interest, possibility, and what each individual brings to the conversation. Re-imagined use of time and space provides children with a feast of creative possibilities.

Rethinking Time: "The Student is the Artist" (Douglas & Jaquith, 2009, p. 9)

In a Choice-Based art studio, the teacher, assuming now the role of mentor, facilitator, artist-in-residence, and sometimes co-conspirator, provides a setting and an expectation for students to find and develop their ideas for art-making. Children arrive with ideas brimming, as described by my former student quoted earlier, who lamented having no place in school to express the daily paintings in his head. Or sometimes students enter the studio without a particular idea but open to creative play and possibility, ready and willing to explore and experiment in order to develop a new concept. Rather than adhering to a fixed lesson plan where every minute is planned in advance, TAB classrooms are specifically structured to acknowledge students' ideas and provide the teacher time to inquire about them. By listening to and observing student inquiry, the teacher can support learning by offering references, resources, and guided connections to the art world as well as to other domains.

Where students are afforded the opportunity to make artwork of their choosing and at their own pace, time must be renegotiated and allowances be made for the range of learning styles and preferences found in each group. "It is unlikely that students will become knowledgeable about their own artistry unless they have the means to self-direct their work throughout the year." (Douglas & Jaquith, 2009, p. 3) In a learner-directed program, children are rarely doing the same thing at the same time. Assignments and due dates must be flexible enough to allow for this new reality or they may be done away with altogether. Do adult artists create their work through prescribed assignments and due dates or is there something else driving their production? In a Choice-Based art studio, teacher and student consider this and other questions relating to authentic art-making and respond, in part, by reconsidering and restructuring students' time.

How and when time is allotted to creative work, "a precious commodity" in today's schools, holds "tremendous implications for teaching and learning" (Jaquith, in Jaquith & Hathaway, 2012, p. 18). Teachers seeking to nurture creativity in their students need to monitor time closely to be sure that learners' time is both maximized and defended.


Ela Chintagunta


Margaret Boersma

Rethinking Space:
From Classroom to Studio

"Everything I ever wanted to do in art is here." – sixth grade boy, describing his choice-based classroom

I will recount how I transformed a school art room into a community art studio and as I do, imagine that you are the science teacher, the language arts teacher, the French teacher or the math teacher. How could this concept inform your practice? Pay close attention, because in the two schools where I have made these changes in the art program (one a private K-8 school for the gifted and creative, and one a public middle school), similar changes began to happen in other classrooms around the school. For example, the French teacher in my current school is experimenting with

offering students their choice of learning centers for language acquisition. She observes unprecedented engagement, particularly with some previously hard-to-reach creative types!

1. Organize and arrange the classroom (studio) for student autonomy.

A good way to design the learning studio is to create media-based centers. Arrange tools, materials, references, and resources into distinct centers (e.g., Drawing Center, Painting Center, Collage Center, Clay Center, Sculpture Center, Fiber Art Center, etc.). Some teachers do this by making a table space for each center; others place the centers around the exterior of the room and encourage students to find a near-by table to set up their work space. The important thing is to make needed items easy for students to find, use, and maintain.

I think if I taught language arts instead of art, I might set up a poetry center, a newspaper center, one for short stories and another for biography. I would teach brief lessons at each center, sometimes to suit my own teacher agenda, and other times suggested by observed student need or interest, being always mindful to protect the majority of our allotted time for creative play and production. Teachers using this construct consider the important elements of their subject area and design Choice-Based learning centers around these. The difference perhaps between this type of center and the more traditional center-based approach is that for creative outcomes and personalized learning, a predetermined task or product is not prescribed but developed by the learner with facilitation, coaching, and mentoring from the teacher.

2. Emancipate the art tools and materials.

Most art teachers are pretty good scroungers, collectors, and hoarders. They save everything for possible future projects and can be stingy about letting students have access to these treasures. Once the studio centers are established, it is merely a matter of stocking them with the materials usually locked away in the supply closet. One student exclaimed that a great thing about our Choice-Based art program is that we have so many more materials than we ever had before. The truth is that we have the very same materials; only now these are out, visible, and available. One change, however, is that it is no longer necessary to have a "class set" of every needed item (Douglas & Jaquith, 2009). Now six or eight watercolor sets will be enough. The same idea applies to rulers, drawing models, paint brushes, ink rollers. Decide how many students can comfortably work in each center, and make this number of items available there. Posters and signage, sometimes designed by the teacher and other times by students, provide needed information on how to use materials or what steps to take to set up or clean up the center. Posters, reproductions, and collected objects complete each center and provide inspiration as well as instruction. The written and collected items in each center become a "three-dimensional lesson plan" to help guide, inform, and inspire student artists in their work (Crowe, 2002, as cited in Douglas & Jaquith, 2009, p. 17).

3. Introduce the studio centers to students one at a time.

Teach students how to set up their work space, show some possible ways of using the materials and tools, and describe how the centers are to be left at clean up. The idea is that in a community art studio, tools and materials are available to all, organized with care, accessed as needed, and cared for properly. Artists using the studio are responsible for cleaning up their space and leaving the studio in good shape for the next group of artists. When running smoothly, an eighth grade class can follow a kindergarten group and a third grade class can walk right in behind the grade six artists who are just leaving; the studio is always ready for the next group.

Instruction and Assessment

Perhaps I have peaked interest in the idea of student-as-artist and classroom-as-studio. But how, when, and where does instruction take place and what about assessment? In most Choice-Based Art programs, the teacher offers whole group, brief lessons at the start of class. Referred to as "five minute demos" (Douglas & Jaquith, 2009, p. 25), the idea is to give just enough information for students to get started. Instruction then shifts to small-group or individual mentoring, based on demonstrated needs and interests in the group. These brief lessons focus on what the teacher deems everyone in the group needs to know and from there, instruction and information can be customized to fit the learner. Students can opt in or out of these various offerings and groupings.

Assessment of learning happens in many ways, from casual observation and response to more formal self-reflection, critique, or preparation for display. Teachers in a learner directed classroom are always on the lookout for ways to extend and frame learning based on their observation of students at work and the many conversations the art-making sparks. This day-to-day noticing and responding is, to me, the most valuable form of assessment.

Choice-Based Art teachers utilize multi-faceted approaches to assessing and reporting progress to fit various populations and administrative requirements. One simple form of assessment that I find indispensable is an end-of-term reflection in which I ask students to recall what they made, what they learned, what they got better at, and what they still want to improve upon. I ask what they liked about art and where improvements are needed. But far and away, my favorite question to ask is the one I save for last:

"One goal I have for my students is that over their time at our school they 'fall in love' with a process, medium, technique, tool, or idea for art-making. Did this happen for you? Please tell me a little about it here:"

Borrowing Torrance's words to probe for understanding has provided me with important insights about my students and our program. I see from the following answers that my students appreciate their ability to specialize, to go deep, and to work on one idea or with one medium or technique until they are ready to move on. These opportunities are all too rare in school. Reading these responses lets me know that my students value the creative freedom they enjoy in their learner-directed program. The following responses are from an average group of eighth graders:

"Pencil drawings, specifically people. I want to be able to capture emotion in the faces of real people."

"I fell in love with abstract, or being able to draw something different with a lot of imagination."

"I fell in love with acrylic paint. Actually gold acrylic paint. I just love the way it looks on the paper."

"I really enjoy sketching with a pencil."

"Sewing clothes. I hate paying a ton of money for something you can make."

"This quarter I really liked how I got to try other things rather than clay every day, since last time I had art all I did was make (clay) bowls."

"I fell in love with needle-felting this year. After my first time I asked for a whole set for Christmas, and I got it. Now it's a relaxation hobby for me."


Margaret Boersma

"I fell in love with needle-felting, after I learned how, I did it all the time. I loved making needle-felted penguins. Penguins are my favorite animal so I painted, needle-felted, sculpted, and drew them."

"Yes. I was able to explore, discover, then discover again and explore some more. This was helpful for me to 'fall in love' with the art studio and all the things it possesses."

(Student quotes collected in February, 2015 by the author)

The Power of Choice

It's easy to get lost in the nuts and bolts of how to run a Choice-Based program. But the important thing to keep in mind is that the power of such a program lies not with how we dispense paints but with how we support student autonomy and creative growth. There is a shift away from managing groups of students toward a single goal to nurturing intrinsically motivated learners. Programs such as mine appear in public and private schools of all kinds, all across the United States and abroad. Many of these schools do not offer dedicated services or programming for gifted students. A Choice-Based art program may be one of the few opportunities to support gifted, creative learners who yearn for a place to explore and express their thoughts and passions.

Students expect to be told what to do at all times in school. Even 5-year-olds quickly learn they must stay in line, raise their hands before speaking, and wait patiently for directions before beginning anything. Over time, most students accept the necessity of compliance, putting their own interests and ideas aside and looking to their teacher for inspiration (Douglas, in Jaquith & Hathaway, 2012, p. 10).

When gifted, creative students find that there is a place in school where they are encouraged to work on their own ideas and interests, the most frequent response I have observed is not joy or delight (although there is certainly that in abundance), but gratitude. Finally, they have a place to learn at their own pace in areas of personal importance. Think of the possibilities.

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Creating a Culture of Creativity: A Biographical Journey

by Karen Morse

I want to make a difference, says the wide-eyed and hopeful, albeit unseasoned, first-year teacher as she lay awake in the summer nights. She is filled with mixed emotions of uncertainty and excitement about the coming year. Her head is filled with creative brainstorming and planning that will inspire her students. She imagines them to be eager and hopeful that this be a year of genuine interest and a willingness to take in all the magical mystery that a teacher could offer. She knows that over-arching understandings and higher order questioning are key to good planning. She understands the importance of using formative and open-ended assessments to guide planning and instruction. Integrating content came naturally to her while developing units for her college methods classes and during student teaching. Well-aware that genuine differentiation and individualizing instruction for students require extra time and work, she knows that to truly make that difference in the lives of her students, she would need to adjust the content, the process, and the product, especially for her most capable students. She was willing, even excited about this important work. Looking back at her school experience, her most memorable teachers were those who engaged the students in project- and problem-based learning and taught students real-life application of the skills they were taught. She understood that children learn best through experience.

During her student teaching, both the site administrator and her master teacher were often absent and the substitute allowed her to do most of the teaching, offering input most often on classroom management techniques. Even then, she quickly found that engagement was the best management. This was a challenging but rewarding opportunity to make the classroom environment her own and to learn from the students what excited them, what worked, what they liked and didn't like, and how they best learned. She welcomed and solicited their feedback and they respected her for that. By listening to them, she quickly learned the value of flexibility and that her role needed to be more the mentor and *guide on the side* than the *sage on the stage* directing instruction to students in rows. She didn't learn well that way herself. Why would someone so young and full of natural energy be able to sit and listen to an adult preaching diluted facts from a lectern? They were a team and her students were inspired by her own creativity. When they turned the classroom into a small scale student-created model of the Washington Mall while studying the Constitution and exploring how systems of government are similar to systems of the body or systems in nature, how could her students not eagerly anticipate class each day? One student even commented about the kinds of questions she asked, "Why do your questions have so many answers?" It took them a while to understand that she wasn't looking for that one packaged answer that could be just as easily researched online. Rather than simply asking them to tell her the names and functions of the three branches of government, something they could look up and memorize, she stretched them by asking about all the ways government might be affected if there were only two of the three branches. This implied that they would need to know about the three branches and their functions, and then analyze and evaluate this knowledge to generate new and original ideas that evoked critical and creative problem solving.

Curious about the degree to which she could challenge her cluster of gifted students, she regularly added complexity to their tasks and reached into higher level standards to offer more rigor for this capable group. While the regular education group researched and debated the basic principles of the Constitution and how they might re-write the preamble to create a classroom code of sort, the cluster group of gifted students evaluated whether the authors of the Constitution might amend any of its content if they were writing it for the first time in 2015. What are all the ways the authors of the Constitution were influenced by public opinion? What are all the ways public opinion effects government today?

In math, the general education groups benefited from problem solving to reproduce a 3-D puzzle from a model using masking tape and eight one-inch wooden cubes. They had to measure and cut the cubes and tape, learn how to make hinges to hold the blocks together, and work in teams to problem solve while studying and discussing the model's construction in order to recreate their own 3-D puzzle. Her gifted cluster also made the widgets, but then created a business plan to manufacture, market and sell the puzzle during an upcoming school fair. During the process, they learned how to make tables and graphs and do a cost analysis. They figured out how many widgets they would need to produce to turn enough profit to purchase new drinking fountains for the playground. Students wrote letters to the school board requesting permission to have the new fountains installed, learned about the cooling and filtration systems in the fountains, how to calculate PSI, the best location for the installation based on water pressure, accessibility laws, and so forth. They presented the information to the school board, complete with their cost and use analysis, and were granted permission to use their funds to purchase two new water fountains for the school. In addition to stretching the students creatively and further developing their skills of critical thinking, they learned a great deal about effective communication, collaboration, and flexibility.

This was a classroom in which there was such an atmosphere of trust and mutual respect as well as productive business going on that the tone in the room mirrored a bustling and busy office of creative architects working on a design project together. Starting with interest-based instruction so that students personally connect with the content enabled even the most reluctant learner to participate. Her students cherished that she had them up and moving and made room for choice as often as possible.

Think of all the questions I could ask to see if you understood the last chapter we read. What might you ask? Let's generate together a list of appealing topic sentences for your journal entries today so you can choose one that is most interesting.

She knew to stick closely to the standards and made it clear that she had high expectations for their performance, but she was able to teach the necessary skills in a creative manner that stimulated *fluency flexibility,* and *originality* (Torrance, 1979).

Due to the extended role she played as a student teacher, and to the principal's frequent absence, she was permitted to miss faculty meetings and didn't have the usual commitments of regular classroom teachers. Except for a dashed hello in the corridor, she was left to her own devices and essentially unfamiliar with school life outside her own classroom for the 12 weeks of student teaching. She occasionally wondered why other teachers didn't look in on her or worry that the students were with an untrained teacher. She assumed they didn't want her to feel intimidated. And they always seemed to be rushing off to a district meeting or to cover a duty or attend a committee meeting of some kind. She wondered why they didn't smile more often than they did. She noted that teachers rarely seemed to work together or talk about their current projects with students. When she made copies in the teacher workroom and caught glimpses of their work piles, the work usually looked like some kind of formal assessment, often with a corresponding Scantron sheet. She opened cupboards above the counters in search of construction paper and found only yellowed newsprint. A colleague said they didn't use it much anymore. *Even in kindergarten,* she wondered? She tried to integrate art into her classroom each day, though she knew creativity meant much more than what one does with paints and crayons. Never mind she thought, I'm over-thinking this. *I'll buy my own. We need it for our next integrated science, tech, engineering and math project (STEM).*

Although still a very inexperienced teacher in training, she knew she was a natural-born teacher. Her parents were both college professors and she had grown up with a house full of books and a kitchen table full of conversation complete with homemade creamed soup and heated debates about what book made the *New York Times* best-seller list. Dessert was habitually served with a logic puzzle or riddle that her father brought home from lunch with his math colleagues.

In her first official capacity as a new teacher at the same school where she did her student teaching, she is


Michael Wisneski

certain that her colleagues will share her passion and energy now that she is a real teacher. She envisions team meetings in which her grade level team will collaborate while planning exciting units using the models of thematic curriculum development she learned in her university methods classes and applied during her student teaching experience with her beloved students. Her favorite course was on the science of creativity. She had learned that creativity is a complex, but proven science and that each and every one of us is capable of creative thinking; like anything, it takes practice. "Creativity is the ability to think differently to tackle and overcome challenges" (Haydon & Harvey, 2015). With so much buzz about the Common Core State Standards, including guidance for differentiation with depth and complexity, she couldn't wait to hear what this school did to support creative thinking in students. She knew exactly what opening day problem solving activities she would use with her students to teach the process of brainstorming and she was sure that her colleagues would enjoy trying it out with their students. Even with 30+ students in the classroom, she knew this was the only way to approach students for optimal learning.

She was eager to hear how her colleagues stimulated original thinking in students. In what ways did they approach teaching fluency and elaboration so that students could fully express innovative thinking? How did they use movement and action to generate interest and stimulate thought? What were all the ways they applied imagery and visualization, fantasy and humor? How do students move from knowledge based questioning to complex higher order questioning that leads to understanding? What kind of real science is being taught? How is the content integrated across the curriculum? How did they support the inner child, socially and emotionally throughout the day?

In the early weeks of autumn, this young teacher maintained her enthusiasm but learned quickly that there is a wide spectrum of opinion regarding the Common Core; there are as many variations of implementation as there are teachers and schools and districts and states. Educators have always had expectations and goals for students. It made sense to her that the purpose of the Common Core Standards is to unify the education of our students across the country, while still preserving the autonomy of individual states in deciding how to implement them.

In her particular district, there did not appear to be a great effort to support teachers in the implementation. She thought it would make sense for the district and site support to be the primary influence in how effectively faculty would receive the standards. She knew that the standards in and of themselves do not dictate how the teachers should teach and that her colleagues and she would have as much sovereignty as their district and school would allow. She quietly went about the first semester making it her own responsibility to apply all the skills she was taught in her preparation for this role. If the Common Core was to ask more of students, certainly it was asking more of teachers. She often lay awake at night excited about what next project she could do that would both meet the Common Core standards and engage students. How she longed for a teaching partner to plan together.

One late December night, she made a commitment to take a leadership position in supporting her colleagues, even if her enthusiasm fell on deaf ears. She knew that with her inexperience came some naiveté about the realities of the full scope of teaching, but with unbridled passion for her students, she would forge ahead doing the best with what she knew.

When school resumed after the holidays, she returned with keen expectation for good. She would patiently wait and watch for a receptive colleague to join in her adventure. She began to notice and appreciate the smallest examples of good going on in the school and would compliment her colleagues for their efforts and insights. She remained humble and reserved when discussing the exciting things happening in her classroom. It was obvious that her students adored her. They rushed to her at the start of the day, hugged her and lingered nearby at recess, and delayed their departure at day's end. Her students would often ask their parents to pick them up at the classroom so they could see what had been accomplished that day.

As the year progressed, there was nothing more than cautious observation from her colleagues. Their responses to her questions about their classroom experiences sent the clear signal that she was an outsider and they clung to their tried and true practices like a favorite garment. Likely they thought her popularity was due to her youth and energy. And they weren't wrong, but there was so much more. Her effectiveness came in not only cultivating her students' curiosity, creativity, and intellect, but also in supporting them as important and capable individuals.

At the end of the school year, the principal announced her retirement. No one seemed disappointed, but comments were made that at least they knew what to expect with her and they had a great deal of independence in the classroom. In this school's case, however, that freedom came from disengagement rather the administration's desire to empower teachers. Following the last day of closing meetings, the principal asked to see her.

"For personal reasons the last couple of years haven't been easy for me, and I'm sorry that I haven't been available for you. It may seem like I am not aware of the daily happenings, but I am very much in-the-know of the events and emotions of this school. I know it's the right time for a shift in the school culture.

"The ambiguity between what teachers are asked to do and the support for what they need to do can sometimes squelch the enthusiasm of the best teachers and quickly make the learning experience for students nothing short of unremarkable. I know this and I'm stepping aside because I'm not the right catalyst to lead these teachers through

the next few years of the rigor it will require to turn this school into the great place it could be.

"You are an outstanding teacher and although I wasn't able to provide the support and mentoring you deserved, I know enough about you to see a leader in the making. You are thorough, confident, capable, and creative.

"Next year, there will be a significant focus on more fully and creatively implementing the Common Core Standards. The incoming principal asked me to select a team of teachers who could lead the faculty through curriculum development and I'd like you to be on that team. You'll be the youngest and newest member of the group and it will be hard work—some days you'll feel like Sisyphus pushing a boulder up the mountain, but I think you have what it takes to ignite some creative thinking in the faculty so they can ignite some creative thinking in their students. These are good people; good teachers who love their students and who deliver the skills and the content but who need support with the processes. They long for a deeper understanding of what their students need, but without the background and support, I think they feel sometimes like they're groping in the dark. You seem to intuitively understand these processes and I see you constantly reading, studying, and applying best practices. There has been lots of conversation about how you might share what you know and bring a fresh perspective to the team."

The young teacher paused to be certain that her mouth wasn't gaping and checked her posture as the principal continued.

"Teaching is a noble and worthy gift of selflessness. But optimism in the altruistic teacher is quickly thwarted when the regime of scheduled experiences and excessive regulations on prep time get in the way of connecting with students. The move to the Common Core Standards has punched the pleasure out of teaching for some, but for others it has ignited some interest. We want you and the other team leaders to run with that receptive group to help provide guidance to make sound instructional decisions in small manageable steps. The latter group will have to either get on the bus or buy a ticket at another station.

"Reticent teachers will need to understand that the Common Core is not the solution, but a pathway. The new standards do nothing in and of themselves to or for students. The standards have been the scapegoat for complaint, but the real malevolent dictator is the test-focus and data-driven instruction. Even with the implied changes of the Common Core, testing is still the focus and it shouldn't be. If the instruction is engaging and meaningful, the tests will show favorable results. As we continue with the Common Core, teachers will still be busy assessing and evaluating, but the tests must be used to inform the next step of instruction and stretch, not merely meet the standards for each student. The tests must ask students to apply new thinking rather than regurgitate memorized facts. And tests without ceilings will give us the most informed results.

For the next hour, the principal went on to show a thorough understanding of the Common Core Standards and their purpose.

"Like previous standards, the Common Core Standards are just that—standards—benchmarks. It isn't curriculum and the state isn't telling us how to use them. That is for us to decide. The authors want to be sure that we're teaching content and skills that have relevance to a changing world. We need college- and career-bound students who are thinking about thinking, who can reason and analyze, who master science by doing science. Rather than a list of disconnected topics, we want students to make connections between logical concepts and logical progressions and build on previously learned material; to have the ability to access concepts from a variety of perspectives. Rather than memorizing a series of facts in preparation for a test, teachers work to bring students to understanding through active investigations that engage and motivate them. Students will have lots of experiences to practice with partners and small groups as well as to apply new learning on independent work.

"There are significant shifts in math and language arts, and these shifts are designed to narrow and deepen the way students spend their days. There is an increased focus on non-fiction across the curricula to further develop fluency in reading, writing, speaking, and listening. This means that science and math teachers are now teaching literacy skills. The English Language Arts have an emphasis on foundational literature, classics, and Shakespeare. ELA is the logical choice for creative writing and conversation through stories, drama, poetry, and other literature; we can't lose sight of creativity in any classroom. With a focus on solving problems in math and in other subject areas rather than on choosing responses from a pre-selected list of choices, teachers can create real-life applications for students and wield their way to understanding. All along, the work must fit the student and stretch each one just enough to cause a little discomfort but not enough to burden the student with the insecurities of inadequacy.

"Differentiation isn't a new concept in education, but there is heightened interest and focus on this critical process and teachers have no choice but to differentiate for the diverse populations of students in each classroom. The new standards still aren't sufficient for challenging the brightest students though, and more teachers will need to understand the value and art of differentiation and move more toward open-ended instruction offering experiences that stimulate critical and creative thinking. It has always been our biggest challenge to engage our most capable students. All students need rigor and exposure to complex and critical thinking, but we see some of our most talented learners quickly wither away and lose interest without tasks designed to address their interests and abilities. Curriculum for this group must be qualitatively different than that offered to the general education students.

"This school is a good place for children. I think with new leadership and energy from teachers like you, it could be a great school. Even with just a few changes, a stifled teacher can see new possibilities and a rigid classroom can become a schoolyard for creative investigation. Education of the masses will never be effective. Our founding fathers understood this and thus left it out of the Constitution and up to the individual states to determine education of its citizens. We can have these common standards of excellence but the successful implementation goes far beyond the higher offices of education. It all boils down to the unique application that each state, district, school, and teacher brings to the students. Americans are fiercely independent. We want to be self-governed; at our very core, humans are uniquely individual. Teaching and learning must always be about the individual expression of intelligence, creativity, and contribution. The sooner we stop arguing about the standards and start thinking about thinking, the sooner we'll have a nation of doers."

The young teacher left the meeting flattered but stunned. With contract in hand for the fall and with a summer stipend for curriculum work, she knew her work hadn't gone unnoticed after all. Following her own moral compass had led her down the right path. She never settled for what was easy. She recognized the strengths in others. She was a willing learner with a get-it-done attitude. And each day since she first stepped foot in the coat closet to unbutton her coat at school, her foremost thought of the day was, "How can I bring my very best self to my students today?" She plans to ask that on her last day of teaching.

"Do what you love and can do well."

The Manifesto,
E. Paul Torrance

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Cerulean Hero

by Karen Morse

I know a man who when quite a boy had the confidence of a hero.
And I will tell you his tale.
A lover of life was he, full to the brim and bubbling with joy.
Effervescent comes to mind.
He took many risks; adventure sought this boy.
His sky was cerulean, not just blue.
Azure, sapphire, cyan, cobalt.
Verdant grassy knolls, not just hills.
He saw all things with a unique view.
A hero, you ask? Yes, was he.
For this boy drank in the world with a tender sip that only a boy can do.
And he gave.
I will plant this seed, said he, so that shade will be on your shoulders.
I will play said he, so that you can rest, since you're older.
I will help said he, so that your burden can be lighter.
I will create said he, so that the earth may be a bit brighter.
I will grow said he, to be a man of honor.
And I will pray for strength to face a world
That may not understand who I want to be.
And I will pray for peace. Someone must.
And indeed, the world did not welcome this boy.
Who is he to drink, to plant, to create, to pray, they asked?
I cannot teach those I don't understand.
I cannot play with a boy unlike me.
And the boy wondered.
Do we not all create?
Do we not all plant seeds?
Do we not all pray?
And play, like me?
And the boy learned.
And he grew.
And he tried to see blue like all the others.
And he forgot.
Cerulean.
Azure, sapphire, cyan, cobalt.
Just silly names he knew.
And he began to hate those names.
And he shouted, BLUE!!!
But somewhere inside, he knew it wasn't true.
And so he thought, I must find that boy I was.
With bright hope he remembered.
I am the boy who planted seeds.
I am the boy who played and helped.
And he prayed, in his small way.
For himself.
For the world.
To plant a seed so that we may sit in the shade.
And his radiance was in full view.
That boy, a man.
A hero returned.
And he drank in the world with a tender sip.
And he gave.
Then he pulled out his banjo.
And he sang the blues;
Cerulean.
Azure, sapphire, cyan, cobalt.

Your imagination is your preview of life's coming attractions. *Albert Einstein*

Voices of Children: Promoting Creativity

by Lisa Bloom, Sharon Dole, & Kristy Kowalske

High stakes testing and scripted curriculum in K-12 classrooms have diminished opportunities for creative thinking and problem solving during the school day. Instruction has become transformed into test preparation where knowledge is a collection of disconnected facts and operations learned by rote memorization. Subsequently, students are learning knowledge associated with lower level thinking that is often fragmented and requires little to no creative thinking (Au, 2011). Generally, testing rewards the ability to find answers rather than ask questions and it discourages risk-taking, a distinctive feature of the creative mind (Piirto, 2014).

Education throughout the world has been damaged by curriculum standardization and testing. In a recent study, Kim (2011) confirmed that scores on the Torrance Tests of Creative Thinking have steadily declined since 1990. Although standardization may lead to higher test scores as in the case of China, Hong Kong, Singapore, and South Korea, it does not produce creative and entrepreneurial mindsets (Zhao, 2012). A survey conducted with 5,000 adults in the United States, the United Kingdom, Germany, France, and Japan revealed a universal concern that educational systems are stifling creativity (Adobe, 2012). Even so, creativity and problem solving are often touted as essential 21st Century Skills, as important as reading, writing, and arithmetic (Partnership for 21st Century Skills, 2011). Students today face a vastly different society, one that has been altered by globalization and technology. The educational paradigm that was created to meet the needs of an industrial age is no longer relevant. In this rapidly changing world, students need to be creative innovators because the jobs that exist today may not be there tomorrow (Kelley & Kelley, 2013; Treffinger, Schoonover, & Shelby, 2012; Wagner, 2012; Zhao, 2012).

Can Creativity be Nurtured?

The research indicates that creativity can be nurtured. Guilford, in his 1950 address to the American Psychological Association (APA), was perhaps the first to propose that everyone has the potential to be creative (1950). Since then, numerous researchers have studied creativity and have come to the conclusion that, even though genetics plays a part, nurturing plays a significant role. Among the researchers who found that creativity can be trained and nurtured are Amabile (1992), Beghetto and Kaufman (2010), Piirto (2004), Renzulli and de Wet (2010), Sternberg (1996), Taylor (1988), and Torrance (1970). What does the research say about nurturing creativity in children? Pffeifer and Thompson examined the research for fostering creativity in the classroom and placed the themes they found in the following categories:

(1) Establishing an expectation for creativity;

(2) Creating a creative space;

(3) Maintaining a psychologically safe environment;

(4) Stimulating and rewarding curiosity;

(5) Encouraging autonomy;

(6) Allowing freedom to explore and play;

(7) Providing structure to optimize efforts;

(8) Preparing and engaging students to work;

(9) Capitalizing on the power of groups;

(10) Embracing diversity in the classroom;

(11) Supplying examples;

(12) Being the change you want to see;

(13) Providing "just right" challenges;

(14) Offering feedback; and

(15) Making time

(2013, pp. 245-250).

Purpose of the Study

We thought the best answers as to what it takes to be creative in children might come from children themselves. We have been following 60-80 children each year for 12 years during Rocket to Creativity (RTC), a week of experiences designed to promote creative thinking and problem solving. Through excerpts from interviews, videos, and a photo journal of the creative process during the course of RTC, we present in this article the perspectives of children on whether or not creativity can be nurtured and what fosters creative thinking.

The purpose of RTC is to give children a chance to experience rich opportunities, to use their imaginations to solve problems, to explore authentic topics, and to create novel products. During the week of RTC, children are engaged in problem or project-based learning (PBL). In PBL, with the teacher as a facilitator, students choose authentic problems and work on solutions to those problems. Students use the higher level thinking tasks to analyze, synthesize, evaluate, and create. In addition to being engaged in PBL, the children are also exposed to a wide range of strategies for promoting creative thinking such as brainstorming, SCAMPER, and creating metaphors (Starko, 2014). Combining PBL with creative thinking strategies has resulted in some highly creative outcomes. For example, RTC participants designed a hovercraft, invented a device for helping people with physical limitations, solved the problem of the wooly adelgid, and created animated cartoons.

We have been documenting the creative process of children through photos, videos, and interviews with RTC participants. In past years, we interviewed children about their experiences during the week and how these experiences compared with those they had at school. Students' comments about RTC from previous years indicated the value they saw in the creative process: "I wish we could make more and learn more by doing instead of just sitting at a desk. More doing, more creativeness. In RTC we don't sit at a desk and we are not lectured." Another child commented that school was "…like being locked up in a cage and studying numbers."

The purpose of the current study was to document how children perceive creativity.

Method

A qualitative case study approach was used for the design of the study. Merriam (2009) described the appropriateness of utilizing a case study framework when the researcher is intrinsically interested in the case and hopes to acquire a comprehensive understanding of the phenomenon. Ary, Jacobs, Razavieh, and Sorensen (2006) described the greatest advantage of conducting a case study as the potential for depth, defining individuals within the context of their environment.

Data Collection

Interviews. We conducted semi-structured interviews (Glesne, 2011) with all 71 students in grades 1-8 who attended RTC. We conducted the interviews throughout the course of the week, but a majority took place on the fourth day of camp after students had been immersed in the creative process. We recorded the interviews in classrooms with individuals and groups of students using iPads. Students were asked six questions.

Observations. Throughout the week, we closely monitored the progress of each group. This provided an intimate setting for noting details of the creative process as students worked through the project or problem-based learning experience. Finally, we viewed each of the final presentations where students often described key moments of their personal creative process.

Photo Analysis. In order to document key creative moments, we used iPads and iPhones to take pictures of the students and teachers.

Participants and Setting

The program being studied is a one week creativity camp which provides a field experience for teachers working toward teacher licensure in gifted education at a regional state university in the Southeastern United States. It provides children ages 6-14 an opportunity to develop their creative thinking and problem solving skills. The participants in this study included 71 students and 14 teachers. In addition, 14 students enrolled in an undergraduate psychology course served as assistants to the teachers.

Data Analysis

We began the data analysis process by reviewing the recorded interviews. Next, we transcribed each interview and used open-coding to record

Table 1: Interview Questions

1. Are you a creative person? Explain.
2. What does it take to be creative?
3. Can someone learn to be more creative? How?
4. Why is creativity important?
5. What have you learned about creativity from RTC?
6. Can you describe your creative process throughout the week?
    - How did you come up with ideas?
    - Did you have any ideas that did not work?
    - How did you come up with solutions?

our initial thoughts (Merriam, 2009). Then we synthesized relevant themes (Patton, 2002). These themes emerged from similarities and contradictions between the participants' responses, and in correlation to literature on the creative process (Seidman, 2006). We grouped relevant quotes under themes to provide support and elaboration. In order to increase the credibility of the themes found in the interviews, we triangulated data with observations and photos taken during the week-long camp (Farmer, Robinson, & Elliott, 2006).

Results

Several themes came to light from our data analysis of the children's perspectives of creativity. We used representative quotes and observations to describe each theme.

Using Imagination

Students described how it was necessary to have an open mind and a wild imagination when trying to be creative. One boy in the spy and espionage group shared, "We are making gadgets today, and you can do anything. The mind has to be open so that it can think of anything." Another boy described the process of modifying a gadget over the course of the week. He said, "My mind took me on an adventure."

Other students shared issues that detract from creative potential. One student explained, "Everybody says you have to stay focused, but really that is the enemy of creativity. You have to just open your mind to all of the possibilities. You get one idea and if you just go with it; it's so cool to see all the things you can come up with."

Having Faith and a Vision

Students described the importance of having a vision to pursue. One student explained what makes a person creative. He said, "Their vision. What they can see happen, and then they can make it possible." Students described the importance of having self-confidence and believing in their ideas. One girl shared, "You have to believe in yourself to be creative! Better to believe than not to believe." Another student used the Wright Brothers as an example, describing the idea they envisioned and then the obstacles they faced. One girl shared, "Be original, not afraid to branch out. If you fail, try again. Eventually you will get it." Students understood that the creative process involved setbacks, alluding to the importance of resilience.

Perseverance

Students expressed that creativity required perseverance or grit. One student said, "You have to work hard. You can't give up. You have to keep on trying." Students described their successes and setbacks throughout the week at RTC. The students in the animation group explained the process of developing characters, stories, sets, and learning how to use the various forms of technology. One boy described the set he and another group member designed, "The painting didn't look perfect, but that was okay. We had to keep pushing through." When faced with setbacks, students relied on strategies to help them overcome the issue. Students in one group explained, "We used the SCAMPER method and sometimes you just have to sit down and brainstorm."

On Becoming More Creative

Students offered a variety of opinions about whether people can learn to be more creative. One girl said, "If anyone doubts that you are creative just ignore them because anyone can be creative. It's the best thing in the world." Other students offered advice on how to become more creative. One shared, "You can learn to be creative by experimenting on things and trying to do new things." Another said, "You can help others become more creative. Motivate them. Give them guidance." One girl talked about the decline of creativity. She said, "Some people may be born creative, but may lose it, if they don't use it."

When we interviewed students in three groups, one student initially said people were born creative while another said creativity can be developed. As the children discussed their ideas, the one who initially said you were born with it changed his/her mind and agreed that it could be developed.

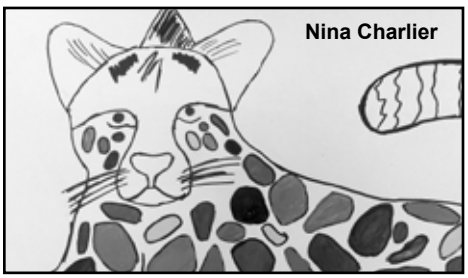
Pathways to Creativity

Some of the younger children correlated creativity to arts and crafts, but a majority saw it all around. One said, "Everything is creative, including the desks that are attached to the chairs with all of the colors." Students described the complicated process of generating ideas. Many spoke of modifying or improving current inventions. One student said, "You can use other people's ideas in different ways and ask for other people's opinions." Another used SCAMPER to generate ideas. He said, "I used SCAMPER about 10 times. *Adapt* I used three times, *eliminate* six times."

Students described the necessity of time, practice, and thinking differently in order to be creative. One girl, offering advice on how to become creative shared,

> ***Think of projects to do. They may not work out, but it's good practice. It can be frustrating when it doesn't work out, but if you're doing it for fun, it's okay. Paint, draw…writing is my thing.***

Other students mentioned that you have to break the rules in order to be creative and be willing to be different. One girl described, "I always followed the rules, but then I started being creative." Another explained, "You can't worry about what other people think." In addition to breaking the rules, other students described the importance of humor in the creative process



Benefits of Creativity

Many students voiced their opinions about the benefits of creativity. One student shared, "It is good for your mind. It is very helpful, and it can be very fun. A lot of things can really be fun if you just imagine them." Along with enjoyment, students also described how creativity was important in other areas. One student shared, "So people can expand their learning frontiers; if you're more creative, you'll get smarter." Students noted this would occur in school and in the real world. One student said, "It lets you think outside the box, it helps you in school. Like if you can think of a different way to solve a math problem, it can help you." Another shared:

> ***It can help you with a lot of things in life. If you're stranded with one rope and open pulley, you can do anything, well not anything, but you can make lots of stuff to help you survive. Being creative helps the mind.***

Discussion

With the emphasis on creativity and problem-solving, RTC provided a nurturing environment for the students, aligning with themes that foster a creative environment (Pfeiffer & Thompson, 2013). Students expressed enthusiasm at the possibility of exploring creative endeavors. Throughout the week, students selected and designed problems and projects while teachers facilitated the experience. This autonomy allowed students to explore their personal interests and passions. When asked what it takes to be creative, students emphasized the need for self-confidence as you pursue a dream or vision and persevere when faced with setbacks. Many students expressed the importance of being fearless and, in some cases, breaking rules. Perseverance and risk-taking are key features found in creative individuals (Csikszentmihalyi, 1996; Torrance & Shaughnessy, 1998). Some of the students, especially the young ones, correlated creativity to arts and crafts, but a majority perceived creativity to be all around them, from the design of the desks to technology. Students understood that exploring creativity can be beneficial by providing techniques to be successful in school and in real-life scenarios.

An interesting component of the study emerged as students discussed whether people are born creative or if creativity develops over a lifetime. Some children initially thought that you were born creative but were influenced by their peers to change their minds. Researchers have launched initial studies about the impact of growth versus fixed creative mindsets (Karwowski, 2014; O'Connor, Nemeth, & Akutsu, 2013). Mindsets define how individuals analyze the malleability of personal characteristics such as abilities, personality traits, and motivations (Dweck, Chi-yue, & Ying-yi, 1995). Future research in this area will be beneficial as we provide students with a foundation for creativity and problem-solving, essential 21st Century Skills.

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III. Models of Creativity: Torrance Incubation Model and Beyond

Sarah Marie Catalana
Lessons With No Conclusions: Using the Incubation Model of Teaching and Learning to Break Barriers in the Classroom

Janette Forman
Using the Torrance Incubation Model of Teaching to Provide a Smorgasbord of Learning

Kathy Goff
TIM (Torrance Incubation Model) in Action

Trevor McAlpine
TIM and the Creative Coach: Using the Torrance Incubation Model (TIM) to Strengthen a Creative Coach's Ability to Affect Change

Susumu Kunifuji
The KJ-Ho and the W-shaped Problem Solving Methodology and Its Application to Real World Problems

Lessons with No Conclusions: Using the *Incubation Model of Teaching and Learning* to Break Barriers in the Classroom

by Sarah Marie Catalana

The summer before I entered high school, I transformed my walk-in closet to a study. There were baskets for each subject, color-coded notecards, and various types of pens and pencils. Everything was neatly sorted and all of the study materials had a specific place. I shudder to think of my reaction if some of the materials were misplaced, the green biology notecards intermingling with the yellow cards that were clearly reserved for Spanish vocabulary terms. At the end of each unit, I wrapped a rubber band tightly around the notecards and threw them into the abyss of a basket labeled for each subject. Although I was a successful student, my learning was confined to my closet-study. Content never leaked over into other units, and certainly did not leap across subject areas. In fact, after learning the material and completing the unit test or final project, I seldom did anything with what I had learned. The information was bound tightly with a rubber band, filed into the appropriate basket, and seldom revisited.

As educators, we strive for our students to make clear conclusions, pointing them back to the day's "Essential Questions" or "Take-Aways," which are typically outlined by one of the countless standards we are expected to meet in a short lesson period. We tightly bind our lessons into clearly defined units, encouraging students to file the information in the appropriate color-coded folder. This type of forced closure often inhibits creative thinking, priming students to find comfort in clear definitions and shy away from open-ended, real-world problems (Houtz & Selby, 2009). As Torrance (1979) proposed,

> ***For creative thinking to occur and to continue to occur, there must be ample opportunity for one thing to lead to another, and to do something with the information encountered. Therefore, it is inevitable that any genuine encouragement of creative thinking in schools must take students beyond the classroom, textbook, and the teacher (p. 31).***

Torrance (1979) recognized that in order to prepare students to creatively and intellectually solve future problems, it is essential to encourage them to "see new connections, enlarging, enriching, and making more accurate one's image of the future" (p. 23). While he emphasized that content knowledge was indeed essential to successful education, Torrance also recognized the suprarational nature of creative thinking, which involves the interplay of intellectual, volitional, and emotional functions (May, 1975). Essential to such creative thinking is the concept of incubation, which refers to the enigmatic yet intriguing phenomenon that time spent away from actively solving a problem typically facilitates the formation of a more advanced and creative future solution (Segal, 2004). Thus, resisting the desire to quickly solve problems and reach closure enhances learning, and has the potential to break down the walls of the classroom and extend learning into the real world.

While it is tempting to deliver content in neat, organized units, Torrance and Safter (1990) proposed that leaving lessons open-ended enhances incubation, encouraging students to "keep the learning going" (p. 11). *The Incubation Model of Teaching and Learning* (Torrance, 1979; Torrance & Safter, 1990) was designed to deliver content while also guiding the learner through the creative problem solving process. The model is firmly rooted in research and contains three stages that are designed to enhance the chances that incubation and quality creative thinking will occur. Stage one, Heightening Anticipation, encourages students to see connections between what they are learning and something personally meaningful. Stage two, Deepening Expectations, refers to the assimilation of new knowledge into existing understandings through various information processing techniques. As the learner interacts with the new material in a deep manner, he or she is intrinsically motivated to continue learning. The final stage, Keeping it Going, allows for students to bring learning outside of the classroom, transforming thought into action.

The Incubation Model of Teaching and Learning is unlike any other model of teaching. It is not a formula for instruction, but rather a shift in thinking. Less becomes more; when students are not given direct explanations and answers, their dissatisfaction promotes independent, curiosity-driven learning. This article is meant to illus-

trate the transformative power of the model as both an instructional technique and a framework for thinking. Each stage is briefly described, followed by an analysis of the theoretical basis of the incubation process. Finally, practical suggestions are provided to illustrate how encouraging incubation and creativity can breathe new life into the classroom.

A Brief Summary of the Model

Let's imagine we snuck into my closet study and poured the contents of every basket into a misshapen heap on the floor, the entire year's Spanish vocabulary words mixing promiscuously with important history dates and then smothered by algebra formulas. Along with the emotional breakdown that would be sure to occur, something amazing could happen: Spanish vocabulary could bring the history unit on Ponce de León to life, and the drawings of plant and animal cells would take on new meaning when placed next to the lesson on evolution. The disorganization would cause discomfort, but also allow for diverse connections to be made. While I would surely want to organize things again, perhaps the material could be sorted into new categories: biology notecards no longer sorted by chapter but rather by related theories, and new piles formed of concepts that I wished to explore further. I would not be hindered by trying to place the material in the right place, but rather inspired to dig deeper, realizing that the heap of notecards may more closely resemble the "real world" than the neatly labeled baskets that brought such comfort and restriction.

The first stage of the I*ncubation Model of Teaching and Learning*, Heightening Anticipation, serves to encourage students to recognize the "real-world" importance of what they are learning. It is important to note that the teacher is not responsible for inspiring every student to enthusiastically delve into the lesson, but rather to create an environment of curiosity that primes students to engage in learning. Most teachers naturally structure lessons to heighten anticipation, planning "hooks" or "attention-getters" that are meant to attract students and get them excited about the material. The challenge comes in recognizing that what excites one student may seem mundane to another. Instead of attempting to meet the interests of all students, teachers "arouse curiosity," "tickle the imagination," and "create the desire to know" (Torrance & Safter, 1990). Interestingly, this often involves the teacher backing off from instruction, scaffolding lessons to ask thoughtful questions by providing minimal detail, and encouraging learners to confront real-world problems that relate to the content.

Teachers can also heighten anticipation by presenting warm-up activities (either related or unrelated to the content) that provide students with opportunities to stretch the mind and prepare for creative thinking. Students are so accustomed to searching for the "right answer" that a creative warm-up such as listing multiple uses for commonplace objects or building a newspaper tower is vital to shifting into a creative mindset. These activities set the mind free from meeting the day's objectives, allowing students to consider why they might want to learn the material. Thus, instead of informing the students as to why they need to learn the content, the teacher provides the students with the necessary environmental context and thinking skills to creatively consider how the material may apply to their daily lives.

Stage Two, Deepening Expectations, involves the creative assimilation of new content into existing knowledge sets. Torrance used analogies to describe various information processing strategies that facilitate deep learning and encourage students to connect new content with prior experiences. Table 1 describes these strategies in detail.

The final stage, Keeping it Going, encourages students to apply what they have learned and do something with the information encountered (Torrance, 1979). Although most directly related to incubation, this stage is driven by the intrinsic desire to delve deeply into learning, which is established throughout the first two stages. To learn creatively, students first become aware of gaps in their knowledge, anticipating new and original solutions. They search for these solutions by digging deeper, testing and retesting hypotheses, and modifying strategies. Finally, incubation allows time for students to ponder the problem, fitting the pieces together in various ways until dazzling moments of insight and inspiration occur.

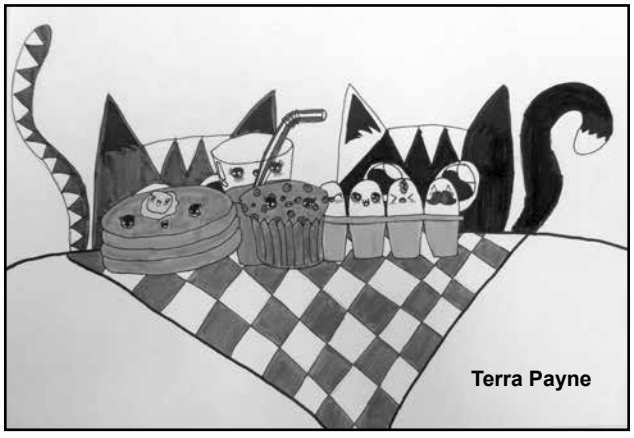


Table 1: Stage II Information Processing Strategies and Explanations (Torrance & Safter, 1990)		
Analogy	Description	Example
Digging Deeper	Go beyond the surface of the content; diagnose difficulties and uncover what is hidden	Investigate the "background characters" in a famous historical occurrence. How did their lives have a silent impact on history?
Looking Twice	Encounter the same material in multiple manners	Investigate a biological process first by reading the textbook, next by exploring in a laboratory setting, and finally by writing an original script and taking on the role of one of the molecules.
Listening for Smells	Engage multiple senses when processing new material	After reading various poems, work in groups to describe how the different poems would taste, smell, sound, or feel. Was the Haiku fiery hot? Bitter cold?
Crossing out Mistakes	"Play" with the material, trying new things and learning what works and what doesn't	After completing a lesson on measuring, attempt to measure various objects in the classroom. The ruler can be used to measure a book, but what about the length of the wall or the stuffed animal? What other measuring tools are needed?
Cutting Holes to See Through	Eliminate superfluous details in order to arrive at a sophisticated summary of the content	Write a summary of a book chapter on the front of a notecard. Next, cut a card in half and narrow the summary. Finally, cut a notecard in quarters and write the most concise and informative summary possible.
Cutting Corners	Avoid irrelevant information	Read and analyze transcripts from real courtroom settings. What information is needed? What information is presented as a distraction?
Getting in Deep Water	Search for unanswered questions and become absorbed in the problem	Choose a topic at the beginning of the year to investigate throughout the entire class. Explore this topic from a new lens each week.
Getting Out of Locked Doors	Think beyond obvious solutions	Solve a math problem using various methods.

Strategies to Inspire Continued Learning Beyond School

While most lessons typically have a clear beginning, middle, and end, Torrance asserted that for creative thinking to occur, one must do something before, during, and after learning (Torrance, 1979). Thus, learning does not end, but rather extends "beyond the a-ha," seeping out of school and into other segments of life. Torrance presented five information-processing strategies to encourage students to keep the learning going beyond the traditional school setting.

The first strategy, *having a ball,* refers to bringing learning to life through humor, laughter, and fantasy. Students are encouraged to put a creative twist on the material they learned, translating it from "school language" to "real-world language." This method is similar to *singing in one's own key,* which Torrance and Safter (1990) described as "seeing implications of the information for present problems or future career roles, and using it to solve personal problems" (p. 11). If students are intrigued by a particular concept mentioned in class, they are likely to investigate this concept in detail, engrossing themselves in outside research and asking others for their thoughts and opinions.

A third strategy, *building sand castles,* involves pondering the content, imagining what could happen in the future, and fantasizing about what is learned. Torrance asserted that *plugging in the sun* was an essential technique to extend learning; students plug into outside sources, seeking inspiration and guidance from others in the school and community. Finally, *shaking hands with tomorrow* describes the inspirational marriage between current learning and the student's image of the future. An individual's image of the future largely determines what he or she is motivated to learn. Connecting current learning with future aspirations is key to establishing intrinsic motivation that will give birth to life-long learning (Polak, 1973).

The I*ncubation Model of Teaching and Learning* is deceptively simple, yet powerfully impactful. The model builds a clear bridge between theory and practice, bringing empirically researched teaching techniques into the classroom in a practical manner[1].

Why is Incubation Important?

The importance of incubation in the creative thinking process has been empirically proven in a multitude of studies (see Csikszentmihalyi, 1996; Mednick, Mednick, & Mednick, 1964; Segal, 2004). Torrance and Safter (1990) recognized that

> ***People prefer to learn creatively--by exploring, questioning, experimenting, manipulating, re-arranging things, testing and modifying, listening, looking, feeling--and then thinking about it--incubating (p. 13).***

Incubation is the brilliant power of nagging curiosity that cannot seem to be quelled, the enigmatic force that underlies the delicious moment of "things finally clicking." We have all experienced the frustration of feeling "stuck" when trying to solve a problem, only to take a break, begrudgingly return to work, and find the answer "staring out at us." Research suggests various intriguing explanations for the benefits of incubation.

Production of Deeply Connected, Diverse Solutions

While many students are eager to hoist their hands in the air and provide the first answer that comes to mind, educators must often direct students to think about the problem, resisting the temptation to come to quick conclusions. An individual's first ideas are seldom the most original or creative, and promoting incubation encourages students to engage in deep processing, creating diverse solutions (Mednick, 1962).

Mednick's (1962) associative theory suggests that the production of one idea leads to another, and thus ideation occurs in a cascading fashion. He asserted that ideas that are far removed from the starting point of idea generation, known as remote associates, are likely to be the most original. You only need a few minutes to see this theory come to fruition in the classroom. Ask your students to spend two minutes listing problems they would like to solve in your school. When time is up, have the students compare the first half of their list to the second half. Chances are most students will have "longer recess" or "no homework" in the beginning of their list, but as the list continues, ideas are likely to become more original and thought-provoking.

Individuals often solve problems by making connections to prior knowledge and tapping into long-term memory (Alexandridis & Maru, 2012). While the capacity of long-term memory is quite large, only small sections are activated at one time through a process known as spreading activation, in which recall of a specific piece of information triggers the recall of another (Anderson, 2010). Thus, encouraging and allowing time for incubation allows the production of more diverse and original ideas.

Creation of a "Clean Start" for Problem Solving

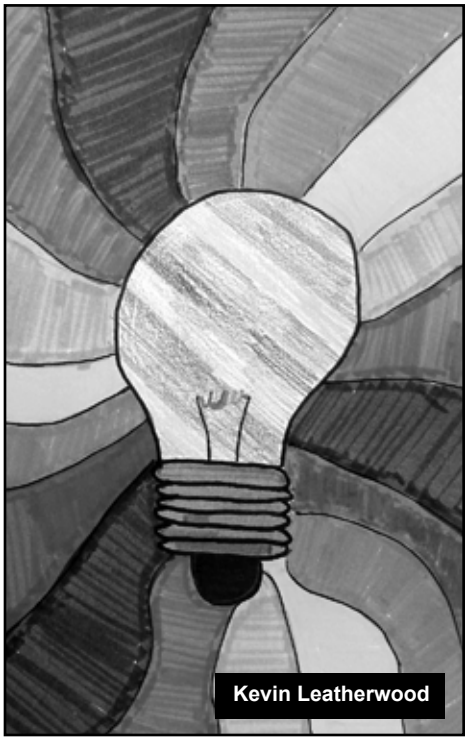
One of the greatest frustrations teachers experience is a look of bewilderment on their students' faces. Although it is tempting to ensure that students understand the material before the bell rings, providing quick and often forced conclusions can actually inhibit deep learning and processing. I have often introduced a complicated topic at the end of class, only to watch my students struggle through a few practice problems and leave the classroom with furrowed brows. At the start of class the next day, they are quick to express their confusion, relay their failed attempts at problem solving, and eager for a fresh start.

[1] The description provided in this article is brief and only begins to scratch the surface of the depth of the Incubation Model for Teaching and Learning. Readers are encouraged to consult Torrance and Safter's (1990), *The Incubation Model of Teaching: Getting Beyond the Aha!,* as well as the thorough research and practice update by Murdock and Keller-Mathers (2008).

Allowing the lesson to trickle over from one day to the next ensures that incubation occurs. Students take time away from problem solving between class periods and return with a "fresh slate" (Segal, 2004; Woodworth, 1938). Time spent away from active problem solving provides students with necessary rest, and allows unproductive response sets and ineffective strategies to weaken through a process known as beneficial forgetting (Smith, 1995). Incorrect ideas and unproductive strategies lose their recency value after a period of incubation, and thus are less likely to interfere with the emergence of new ideas (Murdock & Keller-Mathers, 2008).

Non-Conscious Idea Generation

Indeed, it is quite possible that some of the positive effects of incubation are a result of unconscious work, or non-conscious idea generation (Dijksterhuis & Meurs, 2006; Snyder, Mitchell, Ellwood, Yates, & Pallier, 2004). Although one may not be actively engaged in problem-solving, neural connections are deepening and strengthening as incubation occurs. Moss (2002) suggested, "Fragments of each problem may be randomly and unconsciously recombined until a solution is reached" (p. 208).


Kevin Leatherwood

The Incubation Model in Action

Teachers are constantly bombarded with the "next big thing," often forced to fit their lessons into new frameworks and expected to address multiple standards while teaching overwhelming amounts of content. The *Incubation Model of Teaching and Learning* is not meant to add expectations to teachers, but rather to provide a new lens through which to consider teaching and learning. In fact, teaching through the model often requires teachers to reduce instructional time, chopping off portions of the lesson that are structured to provide closure, and instead priming students to keep learning going.

Murdock (1993) offered the following general characteristics of the *Incubation Model for Teaching and Learning,* which she gleaned from her use of the model in both classroom and training situations:

1. It is an information-processing model that promotes complex, quality creative thinking.

2. It is iterative in theory; learning does not progress linearly through the stages, but rather spirals in a natural manner. As Nitkowski (2004) described, the model works in a continuous circle that eventually spirals outward: Warming Up, Deepening Expectations, and Extending the Learning continually feed into one another.

3. It combines rational and suprarational thinking skills; learners are exposed to creative skills that are often ignored in a classroom setting.

4. It is meta-cognitive in nature, meaning the model promotes clear content and process elements. Students learn the content while simultaneously developing creative thinking skills and monitoring their own learning processes.

In order to teach for creativity, one must think creatively. All lessons can be presented through the lens of the Incubation Model; what is required is a shift in mindset, a dedication towards teaching for curiosity and continuation of learning, rather than clear definition and conclusion. The following are practical methods to encourage incubation in the classroom:

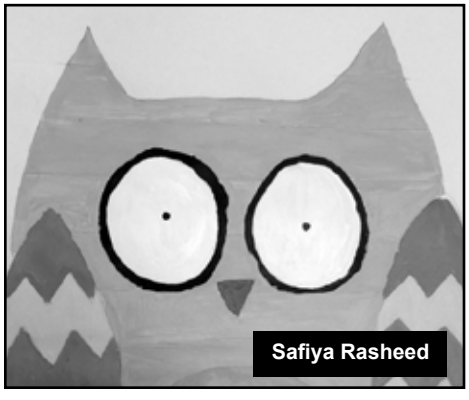
Don't chop up learning. Organization is essential in an educational setting, but it is imperative that students do not equate organization to closure. Naturally, information is presented in chapters or units, but students need to understand how the information interacts in order to keep learning going. Suggestions for promoting this understanding include:

-At the end of a unit, have students work in groups to investigate the order in which the text introduces the material. Why were certain concepts introduced first? How do ideas build on one-another? Is there a more effective way to deliver the content?

-Assign ongoing projects that extend across units, chapters, or subject areas.

-Ask each student to brainstorm five or ten main ideas from the lesson. Next, split the students up in groups and have them sort the ideas in as many ways as possible.

-Create an ongoing web of content on a wall in the classroom. Use string to show how various ideas build upon one another as the year progresses.


Safiya Rasheed

Build time for regular breaks in the classroom. Incubation takes time, which is a teacher's most precious and limited resource. However, there are several creative ways to build in time for breaks in the classroom.

-Designate a time each week for "independent investigation." Students can use this time to "dig deeper" into a concept of their choice. This time can be a productive break from regular course work, and since students work on related projects from week to week, they will incubate on their investigation as time progresses.

-Take a walk. One of the most effective ways to encourage incubation is physical movement (White & Torrance, 1978). Engage the whole body and put learning into perspective. Take a lap around the school and ask students to list reasons why learning the content is important; this helps them return to the classroom with a fresh perspective and renewed energy.

-Schedule time to take personal breaks! While a planning period always seems to slip away in giant dollops of time, allowing a short period for relaxation will help you return to teaching with a renewed mind.


Amber Moca

Allow for creative thinking that is unrelated to the content. Creative thinking is often uncomfortable; students often shy away from taking risks and feel safe within boundaries. Warm-up activities prime students for creative thinking and help students realize that learning to think critically and creatively is equally as important as understanding content (Torrance, 1970).

-Complete the same creativity challenge multiple times. For example, start each Friday with a different tower building challenge. Students will grow increasingly comfortable with risk taking and will incubate on past successes and failures as the week goes on.

-Build up to creative thinking in the content area. First ask students to brainstorm a list of multiple uses for commonplace objects such as a paperclip or plastic fork. Gradually encourage such divergent thinking within content areas, asking students to brainstorm descriptors of famous historical figures or multiple ways to conduct a science experiment.

Teach the same content in multiple ways. Encourage students to "look twice" at the content, deepening learning and extending boundaries.

-Read the same story to the class each day for a week and ask students to respond in various manners. For example, the first day by listening quietly, the next day acting out the story silently, and the next brainstorming alternative endings (adapted from a suggestion by Torrance & Safter, 1990).

-Choose unifying themes that cross subject areas. Study the history of the Black Plague and use math formulas to illustrate how rapidly the plague passed from one individual to the next.

Teach responsively and flexibly. While planning instruction is important, it is essential to remain open to opportunities for enhanced learning.

-Investigate current events through the lens of your content area. What is the biological explanation for the Ebola outbreak? How would such an occurrence affect the economy?

-Ask students to write their top three areas of interests on a notecard at the start of the year. Enlist students to help construct the syllabus, providing key objectives but leaving room for students to fill in the details.

-If students are engaged in a lesson, don't rush to bring it to an unnatural close. Let learning seep over from one day to the next if possible.

Less is more. At times, it is important for students to feel dissatisfied at the end of a lesson. Students are comfortable with closure, but if they leave class slightly confused they are more likely to ponder the lesson and try to reach a conclusion on their own.

-End class with a group discussion, rather than a summary activity. Encourage students to discuss what they are wondering about and create a safe place to be "confused."

-Provide students with the minimum and ask them to fill in the details. This technique is especially helpful when communicating objectives. If the teacher provides the main objective and asks the students to brainstorm related ideas, it is likely that the students will consider topics that the teacher had originally neglected.

-Ask questions that have no clear answer and encourage students to discuss multiple solutions.

-Introduce next week's topic on Friday afternoon, and encourage students to think about what they would like to learn over the weekend.

Breaking Boundaries

When my family moved from the house I grew up in, I was astonished to learn the girl who took my room actually stored her shoes and clothes in my precious closet study. I can still remember dumping all of my materials into a large trash bag, hesitating, and then fishing out a few books and sheets that I wasn't ready to part with: a diagram of the human brain, an encouraging letter from a teacher, and some heavily graffitied psychology notes. This content made it out of the closet, spurred my curiosity for learning, and played an integral role in my current studies of educational psychology and creativity.

At times, we must unravel the rubber bands that neatly bind the content we deliver to our students. However, learning is not meant to be confined, but rather meant to seep into every part of our lives, breathing meaning and creating the desire to dig deeper and challenge ourselves. Such learning is embodied by a shift in perspective, a recognition of the boundless nature of curiosity, and a dedication towards "going beyond the a-ha" (Torrance & Safter, 1990).

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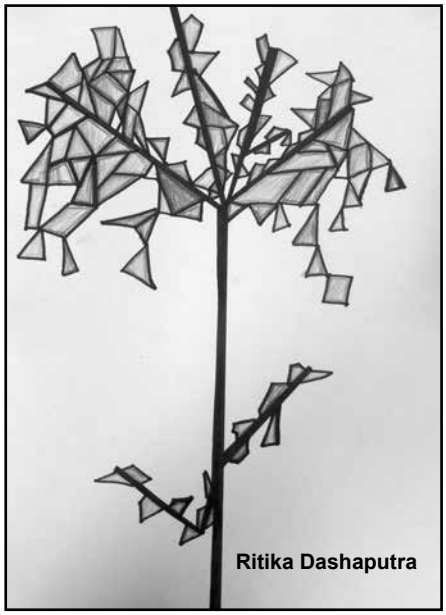

Using the Torrance Incubation Model of Teaching to Provide a Smorgasbord of Learning

by Janette Forman

As a gifted educator and the mother of four gifted children, I consider it my job to encourage students in their interests, as well as expose them to ideas and topics outside their current pursuits. Without exposure, how can they know if they are interested in new topics? Sparking interest leads to learning.

Overview of the Incubation Model of Teaching

Using the Incubation Model of Teaching, developed by Paul Torrance, I try to encourage my students and my own children to explore new horizons. Torrance and Sisk (1997) summarized the goals of the Incubation Model of Teaching as follows:

> ***Before creative thinking can occur, something has to be done to heighten anticipation and expectation and to prepare learners to see clear connections between what they are expected to learn and their future life (the next minute or hour, the next day, the next year, or 25 years from now). After this arousal, it is necessary to help students dig into the problem, acquire more information, encounter the unexpected, and continue deepening expectations. Finally, there must be practice in doing something with the new information, immediately or later (p.91).***

The Incubation Model is made up of three stages: **Heightening Anticipation; Deepening Expectations; and Keeping It Going.** First, pique students' interest. Make them aware of a problem to be solved, or arouse their curiosity with something that intrigues them. Then, increase their interest through digging deeper into the subject matter, interacting with material, making guesses and improving them, incorporating the senses, focusing on important ideas, becoming aware of complexities, using visualization, and considering creative solutions to apparently unsolvable problems. Finally, take it beyond the classroom, teacher, and textbook by relating it to students' own lives, having them use hypotheticals to build ideal solutions, using humor or fantasy, and tapping into new resources to learn even more. How these are achieved depends on the subject matter.

Stage One:
Heightening Anticipation

Torrance's first stage is to ignite interest in a learner. Like an artist's palette or a delicious buffet, there should be something to appeal to all moods and appetites. A different "hook" will work to catch the interest of different children. With my students, I like to quiz them on something that they think they know the answer to, but will be astounded when they realize that they are wrong. In my microbiology class, I invite everyone to guess when and where the last plague case occurred. Many students guess that it was Europe in the 1300s (correctly recalling the Black Death they learned about in school). They are surprised to learn that plague is endemic in rodents in the western United States and a few other countries, so there are a few current cases every year, in their own country! I then suggest that they quiz their parents, since they now have knowledge that their parents likely do not.

Other students are intrigued when connections are made between their own life and the subject matter. I point out that my microbiology class could save their life; it teaches them to discard damaged cans to avoid botulism poisoning and to get a rabies shot if exposed to an animal possible carrying rabies, since rabies shots are ineffective once rabies symptoms have developed. Almost all students enthusiastically examine fossils, textiles, printed pictures, and more with hand-held low-power microscopes, as well as prepared slides under a higher-power large microscope. After seeing how much they had never seen in the world around them, they want to learn more.

A few years ago, I left a book about great artists where my own children would find it. One child immediately started flipping through the pages. Another looked at the pictures of art in the book without reading the text. The other two became interested when I showed them an online game site (www.freerice.org) that has a section quizzing participants on which painters created certain paintings. They then read the book so that they could do even better on the online quiz. As follow-up, I showed them famous paintings at the Art Institute of Chicago.

In my optical illusions class, I show students how individual dots of color can blend to form other colors (using hand-held microscopes looking at color printouts). We also make our own handmade tops which blend colors when spun. I show them a photo of the famous Georges Seurat painting *A Sunday Afternoon on the Island of La Grande Jatte,* which uses pointillism, or dots of paint, to create images. It is on display at the Art Institute of Chicago, so they may be able to visit and see it in person. Paintings are actually optical illusions, since they are flat but can appear to be three-dimensional. We then create our own illusions with tape on walls and floors, and go beyond optical illusions into olfactory and auditory illusions.

Stage Two:
Deepening Expectations

Torrance's second stage of the Incubation Model of Teaching is "deepening expectations." I introduce a variety of concepts at both a high and a low level, to give as much complexity to students as they can understand. Different pieces of information resonate with different students, so I try to give them as much as they can take in, and see what sticks with each student. The students learn that I have very high expectations for them, and classes are a mixture of playfulness and serious studying.

While discussing one idea, we can segue into another. By revealing connections between different subject areas, we can engage the interest of children in new subjects. I connect microbiology to history by telling students how famous people from the past died of illnesses that we now treat with vaccines or antibiotics. My mock trial students learn about public speaking when they give opening statements, closing arguments, and question witnesses on the stand. They also learn history in the context of famous court cases. I incorporate botany and paleontology into microbiology by having students use low-power microscopes to examine fossil ferns. They learn that these fossils are older than the dinosaurs, dating to when the area now called Illinois was a tropical swamp located near the equator. I discuss taxonomy in the context of bacteria names. We explore scientific notation of very large numbers while talking about how many bacteria there would be after one day if just one bacterium had ideal conditions to multiply and none of the bacteria died. Some students beg me to wait until the next day to give the answer because they want to do the math themselves to figure out the extremely large number!

Torrance encouraged using the five senses to deepen learning. To encourage appreciation of microbiology, parents can have their children try eating yogurt, cheese, blue cheese, kefir, sauerkraut, kimchi, yeast-based breads, sourdough bread, and anything else fermented. Beneficial bacteria and fungi make so many foods that we enjoy. Even chocolate is fermented after harvesting the beans, in order to have the complexity that we expect. While thinking about how sun warms our skin, or how plants use energy from the sun to make sugar, we can also marvel at how photons of light behave as both a particle and a wave. Biology and physics are connected!

Personal experiences also make learning more relevant. Most children can remember a time that they were sick. Some of them had their strep throat infections cured by antibiotics. They appreciate how antibiotics cured them after hearing how George Washington died of a throat infection. Growing a plant themselves makes children more likely to eat that vegetable, and watching friends enjoy an activity makes them more likely to try it. Seeing or touching an animal brings another dimension to learning. One of my children read a book about dangerous animals and asked what a tapir was, since the book said that piranhas ate them but didn't show a picture. We

looked up tapirs online right away, and a day later we went to the zoo to see one. At a library program about bats, we were all able to touch a live bat's fur at the end of the program, and it was the softest thing we ever felt.

Another way to keep interest high is to surprise students with something unexpected, especially if it is an area they think they know. Although my students are growing up in suburbs of Chicago, there are many things that they don't know about the area. In the context of microbiology, modern plumbing has made a larger contribution to preventing diseases than antibiotics, and the city of Chicago was raised between four and fourteen feet so that gravity could drain the sewers that were built. You can still see old buildings that were not raised, so the streets now rise above former street-level windows. The Chicago River was reversed so that all that waste would drain down towards the Mississippi River rather than stay in Lake Michigan, Chicago's drinking water source. Some students become interested in other aspects of Chicago history, microbiology history, or engineering.

Torrance also encouraged focusing on important information and discarding unneeded information. Each of my classes finishes with a "Very Tricky Quiz — read carefully!" Virtually all my students dive right into the questions, missing the part of the instructions that says to read all questions before beginning. The last question says to answer none of the questions, and just turn their paper in. By being tricked, they learn to be careful readers, and then we go over the answers as a review. Students who previously had a class with me are happy to play along to preserve the surprise for new students

Stage Three: Keeping it Going

Torrance's third stage of the Incubation Model of Teaching is keeping it going "beyond the classroom, textbook, and the teacher" (Torrance & Sisk, 1997, p. 228). After broadening students' horizons in class, they themselves can see where they want to go. On their own, students can check out books from the library (perhaps from the adult section) and visit museums. They can create poems, songs, short stories, or movies. Students can shadow a professional for a day, spend a day observing in a courtroom, or find a pen pal (or email pal) in another country. The opportunities for taking their learning further are as limitless as their potential, interests, and motivations.

Conclusion

The Torrance Incubation Model of Teaching provides a blueprint for teachers and parents to use to spark interest in topics and ideas, engage students deeply, and set the stage for continued learning and application in their lives. It is a framework that illustrates how learning can move through a spectrum of depth and meaning to students. As Torrance suggested in the way he designed this model, the most important first step is to provide opportunities, resources, questions, materials, prompts, and other entrees to pique students' interest. Once you hook them, they are bound to dig in and learn in ways that are meaningful and applicable to them.

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Ryan Kiamco

TIM (Torrance Incubation Model) in Action

by Kathy Goff

TIM (Torrance Incubation Model) in Action

Creativity is a lifelong adventure. E. Paul Torrance began developing the Incubation Model in 1949 when he became increasingly concerned that graduate courses in psychology and education had such little impact on teaching and learning in classrooms. He knew that something could be done to arouse and motivate teachers to keep students thinking about their insights. To this end, he developed the three-step Torrance Incubation Model of Teaching (TIM).

TIM is easy, invigorating, and powerful in addressing the learning needs of all learners and encouraging creativity. TIM is not only a valuable method for designing hands-on activities, but also for developing a variety of learner oriented offerings. Since first typing and copy editing the original Incubation Model manuscript, this author has used the model to develop speeches, grants, curricula, and programs. Presented here are three very different programs that were designed using TIM.

TIM Programs

The Torrance Incubation Model of Teaching (Torrance & Safter, 1990) is a common thread used to develop the three programs discussed in this paper: a grant, trainings, and lessons. This simple three-step process is easy to remember and opens up presentations and curricula to the creative contributions of the participants or students.

The first project was a collaborative effort with Dr. Torrance and a federal grant designed to foster the creative development of older adults, with and without developmental disabilities (Goff, 1992, 1993; Torrance, Clements, & Goff, 1989). The Incubation Model of Teaching (TIM) was used as the framework for creating all of the lessons in the areas of art, dance, drama, fitness, and creativity. Monthly themed TIM lessons were designed like recipes to be used for year-round creative and expressive learning experiences.

The second project was a service learning grant developed to pair senior undergraduate gerontology students with elders in learning about horticulture and each other (Goff, 2004). Both groups came together for a weekly horticulture lesson and lecture at a university. Following the lesson, both groups adjourned to the local elderly nutrition center for lunch and discussions. TIM was used from conception to delivery and evaluation.

The third project was an award-winning, collaborative effort between an elementary school and an adult day services program. This multigenerational mentoring program received the 2008 Community Involvement Award by the Oklahoma Association of Homes and Services for the Aging. The elders were bussed to the school every other week to meet with fifth grade students in the gifted and talented program, for an hour long educational activity. A students and an elder were paired to complete the day's creative learning activity which was designed using TIM.

Torrance Incubation Model (TIM)

A key ingredient to success in creative learning is time for incubation. Incubation involves flashes of insight while in the process of puzzling over a problem or dilemma, mulling it over, fitting the pieces together, and trying to figure it out. Incubation is the part of the creative learning process that calls for little or no conscious effort (Osborn, 1963). It is the time between being saturated with information pertaining to the problem we are solving and the flash of insight with a solution. The flashes of insight might come while going to sleep, taking a shower, reading a newspaper, driving alone, sitting outside, relaxing, or playing.

The incubation process is a critical element in creative learning. Unless time is allowed for one thing to lead to another, there is little possibility of finding a really creative solution. Supportive, nurturing environments allow time for people to think, to mull over ideas, and to incubate. Since time is a relatively abundant resource for elders, it seems logical that engaging in creative thinking will raise levels of satisfaction and wellness (Goff, 1993).

In order to create learning activities that were both creative and appropriate for different generations, TIM was used. This model has been used successfully with students of all ages (Torrance & Safter, 1990) as well as older adults (Goff, 1992, 1993).
The three stages of TIM are:

1. Warm up

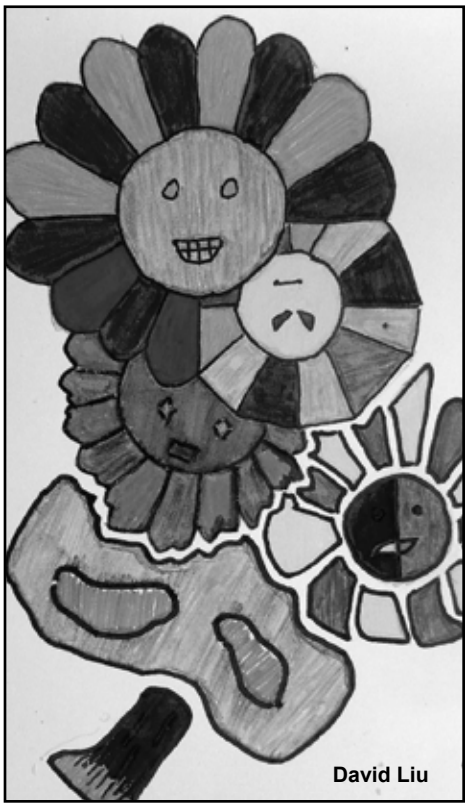
2. Dig in

3. Go beyond

Warm up is the first stage with the purpose of creating a desire to know or learn more, arouse curiosity, tickle the imagination, and give purpose and meaning. The warm-up process is essential, both mentally and physically. Some warm-ups include physical stretching and breathing to music to clear the cobwebs and get the blood flowing. Others use imagination exercises to awaken the senses and engage participants.

Dig in is the second stage with the purpose of digging beyond the surface and getting more deeply involved with new information. Deferring judgment, making use of all of the senses, opening new doors, and targeting problems to be considered or solutions to try are part of the second stage of creative learning. There must be ample time for one thing to lead to another.

Go beyond is the third stage with the purpose of incorporating creative thinking skills into our daily lives. This stage involves making the experiences real, such as visiting an art exhibition, engaging in community actions, or sharing products created in stage two with frail elders or children in hospitals.


David Liu

By using TIM, teachers can facilitate insights and flashes of ideas. Understanding the process, and patience, will increase the chances that the flashes will occur and that they will be useful in daily lives.

People are inquisitive, exploring, searching kinds of beings. We are self-acting and cannot keep our restless minds inactive even when there are no problems pressing for solution. We continue to find problems and cannot keep from digging into things, turning ideas over in our minds, trying out new combinations, searching for new relationships, and struggling for new insights. This comes from our cognitive needs—our need to know and to dig deeper into things. Our aesthetic needs—our need for beauty, the balanced relationship, the graceful and certain movement—are almost relentless. Cognitive and aesthetic needs are served by creative ways of learning which develop the motivations and skills for learning throughout life.

Quality of Life Program

The first program designed using TIM was the Quality of Life (QOL) Program, a federally funded grant program whose mission was to reduce dependence and increase self-sufficiency among our most vulnerable citizens (Torrance, Clements & Goff, 1989). The QOL program focused on stimulating development and expanding training and service to create awareness of the value of innovative programming. Elders deserve, and are capable of benefiting from, innovative fitness and creativity programming. The purpose of the QOL program was to increase the independence of older adults and their integration into the community through physical and expressive activities designed to improve fitness, creativity, and quality of life.

Teams from the five disciplines of art, creativity, dance, drama, and fitness met regularly to brainstorm and mesh activities from the other disciplines into their own using TIM as the framework. The central focus on play and fun contributed to the melding of disciplines as well as to the recognition of the creative spirit of each individual as a central element of the life force.

Training modules were created by teams of graduate students and faculty mentors from the five disciplines of art, dance, drama, creativity, and fitness. The modules were built around the 12 months of the year and focused on the seasons or holidays associated with each month. A seasonal topic for each month was determined first, then each discipline incorporated an emotional theme into the lesson highlighting the seasonal theme.

Thirteen senior centers in rural Georgia involving 108 elders were given the 9 minute creativity test before and after the 12-week period (Goff, 1992). Fifty-five elders participated in the QOL activities 3 times per week for 12 weeks, while 53 elders participated in their local activities program. The activity director or staff member, trained by the QOL staff at each senior center, chose and conducted 2 activities per week while a student staff member delivered the QOL activity, from her or his area of expertise, once per week. The creativity and life satisfaction of the QOL participants increased significantly while the creativity of the participants of traditional programs decreased (Goff, 1992, 1993).

Senior to Senior

The second program was the Senior to Senior: Living Lessons program (Goff, 2004). It was an example of an innovative intergenerational service learning program using TIM. The Senior to Senior program was created to provide meaningful horticulture learning experiences to college senior gerontology majors and senior citizens. The program's objectives were to promote positive intergenerational relationships and to build lifelong learning skills with members of different generations.

The students were warmed up to the program each week by studying gerontology and horticulture therapy. Every other week they joined commu-

nity elders in learning basic horticulture principles in order to grow and sell plants to sustain the program. Finally, the students were taken beyond the classroom with the elders for lunch at the local elderly nutrition site. There students and seniors reflected on the program and whatever else came up. The students were getting real world experiences learning with, and about, elders.

The community partners in the Senior to Senior program were the local elderly nutrition site and a nearby adult day center. At the nutrition site, the students were exposed to nutritious meals and experienced socialization with the elders. The reflective lunches increased the average attendance at the meal site and provided opportunities for re-connections and reunions between elders who went to school together at the local university. The regular nutrition site participants looked forward to additional community members and out-of-town elders coming to the site. The students served as volunteers at the nutrition site, thus increasing their volunteer hours. The elders enjoyed having the young people around, interacting with them and getting to tell them stories.

The Senior to Senior program resulted in increased attendance and participation at the nutrition site, increased student volunteer hours, and increased revenue with the grant paying for the participants' lunches. Students applied gerontological information to their experiences by displacing negative stereotypes with a greater awareness of abilities and diversity among elders. Students gained firsthand experience in lifelong learning skills and the value of intergenerational contact and engagement.

A unique element to this service learning program was its entrepreneurial nature of growing and selling plants. By growing and selling plants, the participants not only learned about plant science, but also about entrepreneurship and a real-world reason to grow the plants. By growing the plants, they were literally contributing to the growth and development of the program and reciprocal results.

Multigenerational Mentoring

All people need a purpose. It seems that too many elders can lose their sense of purpose and connections with younger generations. It is also not uncommon for children to loose connections with elders. The third program was designed to unite multiple generations in creative learning and mentoring experiences.

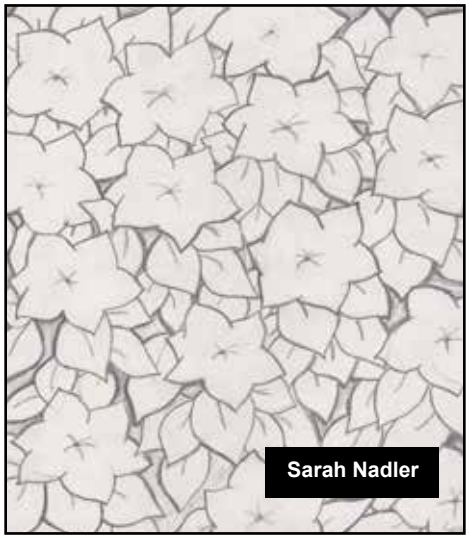
When thinking about a program for elders and children, a focus on lifelong learning seemed appropriate. Consequently, the program was designed to provide lifelong learning opportunities for elders and gifted and talented fifth-grade elementary students. Both groups engaged in creative, educational learning experiences based on the Incubation Model of Teaching (TIM). Elders brought expertise, wisdom, and need for cognitive stimulation. Students brought energy, enthusiasm, and the desire to learn and to be creative. It was a way for both groups to learn and benefit each other.

Research shows that when elders and children come together for meaningful experiences, everyone benefits (Generations United, 2002). Older adults who volunteer are in better physical and mental health and live longer than non-volunteering peers (Zedlewski & Schaner, 2006). Bringing elders to the classroom is a relatively untapped and potentially cost-effective way to positively impact multiple generations (Frick et al., 2004; Parisi et al., 2009). So when two program coordinators collaborated on a program that would benefit each of their populations, an award-winning, lifelong learning program was born.

The purpose of the program was to instill a sense of appreciation for diversity of the human experience by understanding the perspectives of people born at different times in different historical periods via shared educational activities and creative learning experiences. Emphasis was placed on providing dynamic learning experiences and aging awareness by collaborating and creating together.

The program focused on the development of one-to-one relationships of support and encouragement. They were based on mutual respect and fostered the exchange of knowledge and values while engaging in educational activities. Students were reminded each session about the elders being their guests and that they were to focus completely on their mentor and the activities.

The educational activities were not filled with instructions as a strategy to encourage creative problem solving among the pairs. The less participants were told about what was wanted, the more opportunities they had to explore their thoughts, ideas, and creativity. TIM's simple three-step format was used to organize learning activities into meaningful experiences that encouraged creativity. The focus was shifted from seeing creativity as a specific ability with links to certain disciplines (science and arts) to seeing it as an essential process of lifelong learning emphasizing the creation of ideas that may or may not result in external production (Su, 2009).



Conclusion

All of us begin life as experiential creative learners. It seems logical then to believe that this process of learning must be validated by experience in order to meet the needs of all people, not just those who do well on pre-determined standards or who are still in school.

Learning by doing should not be left to mere chance, but should be part of the guidance given to people of all ages. Creative thinking and learning involve such abilities as evaluation, redefinition, analysis, different production, and problem solving skills. Creative learning is a natural, healthy human process that occurs when people become curious or excited about understanding or knowing more. As stated earlier, anytime we are faced with a problem or situation with no learned solution, some creativity is required (Torrance, 1979).

Creativity is an innate ability that can grow anytime in life. Creativity can undergo a resurgence in the later years of life (Simonton, 1990) and increases with engagement in creative learning experiences (Goff, 1992). Creativity is an indispensable ability in the effective development of lifelong learning practices (Su, 2009).

A key ingredient to success in creative learning is the time for incubation. Incubation involves flashes of insight while in the process of puzzling over a problem or dilemma, mulling it over, fitting the pieces together, and trying to figure it out. The incubation process is a critical element in creative learning. Unless time is allowed for one thing to lead to another, there is little possibility of finding a really creative solution. The Torrance Incubation Model of Teaching can help create supportive, nurturing environments that allow time for people to think, to mull over ideas, and to incubate.

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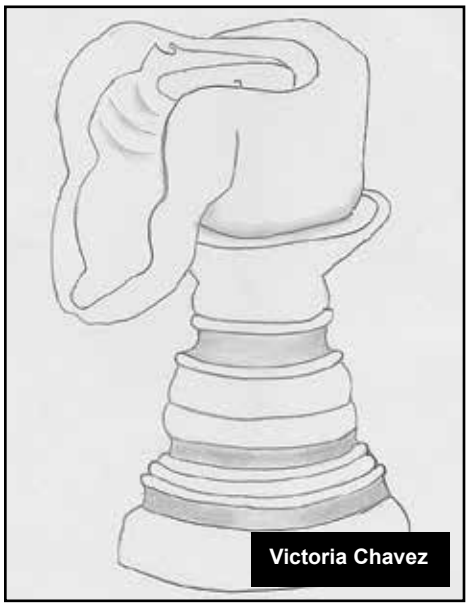
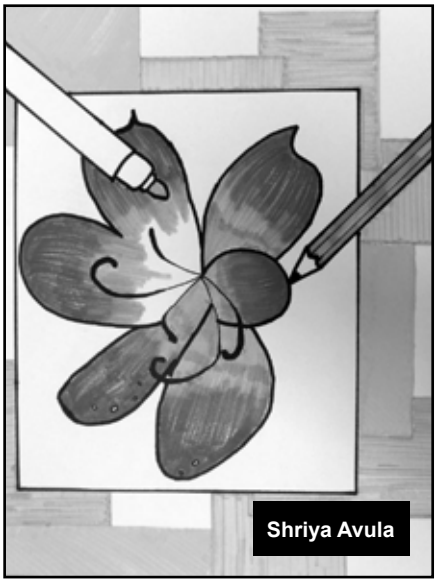


Victoria Chavez



Shriya Avula

TIM and the Creative Coach: Using the Torrance Incubation Model (TIM) to Strengthen a Creative Coach's Ability to Affect Change

by Trevor J. McAlpine

"Coaching is the art of facilitating the performance, learning, and development of another" (Downey 2003, p. 21).

Creativity practitioners generally accept that "everyone is creative," yet they know that the quantity and quality of creative output differs greatly between an untrained person and one who has actively (studied and) mastered the skills, tools, processes, and methods designed to enhance personal and inter-personal creativity (Puccio, Firestien, Coyle, & Masucci, 2006; Scott, Leritz, & Mumford, 2004).

The same is true for coaching. That "everyone can coach" is true in essence, but training and apprenticeship are necessary to turn someone into a masterful coach. Yet this does not mean that the act of coaching should be reserved for those who practise it full-time. As with creativity, coaching is our birthright. Coaching is a natural offshoot of our ability to dialogue and communicate (Senge, 1990).

We want to embrace coaching that strengthens people, the kind of coaching that builds up their capacities to secure future results. So, we are not talking here about directive coaching (e.g., from an expert who trains, suggests, tells you *what* to do and *how* to do it) – this approach is so ubiquitous that most people erroneously think this is the *only* way to coach. We embrace an approach to coaching called Non-Directive Coaching (NDC), where we ask awareness-raising questions that allow the person being coached much more freedom to determine what (and how) to do to achieve the desired results – this builds people up to become more self-reliant (see *Directive vs. Non-Directive Coaching in the NDC* – Key Distinctions section for more details).

Since directive coaching leads to dependency on the coach for future direction and guidance, our focus is to coach in a way that builds up those being coached. The following functional description of the role of a (non-directive) coach may help place the act of coaching into a bigger context:

> ***A coach is anyone (a parent, teacher, administrator, leader, manager, etc.) who helps another person detect opportunities and challenges, better understand situations, and make improved free-will, positive choices in a way that increases that person's capacity to do so in the future (without having to rely on a coach).***

Few of us ever get to be full-time coaches. Most of us find ourselves acting as part-time coaches who assume the role and use the skills, tools, and methods as needed. Sadly, too few actively seek out how to be better coaches. All too often, the great promise of effective coaching turns into real frustration for everyone when poorly done. It is partly because coaching looks so easy that it is so hard to do well.

This work is an attempt to address such a challenge. It is not a primer about coaching per se; rather, it is part of a continuing effort to determine how coaches can leverage elements of the creative sciences to greatly improve the art of coaching.

This work is written in a "generic" language that describes a coach and the person being coached, a person who works inside a particular environment, "an organization." It only takes a little imagination to tailor this generic model to one's own specific circumstances: a teacher (or guidance counselor) and a student in a school; a principal and a teacher in a school; a parent and a child in a family; a manager and a staff member in a business or governmental organization, etc. This tailoring is left to the reader to do.

Coaching: A (New) Context in Which to Use Creativity

The author's formal merging of coaching and creative sciences was first published in *The Creative Coach: Exploring the Synergies Between Creative Problem Solving: Thinking Skills Model and Non-Directive Coaching,* (McAlpine, 2011). That work showed how Creative Problem Solving: Thinking Skills Model (CPS:TSM) and Non-Directive Coaching (NDC) mapped quite well on to each other (CPS:TSM is described in Puccio, Murdock, & Mance, 2007, 2008). This makes sense as both evolved to help people solve problems using creativity, be it explicitly in groups or implicitly in one-on-one dialogues. Ultimately, McAlpine (2011) showed how both parties in a coaching dialogue could start getting better results faster by explicitly using creativity.

Yet that work was just a start. Significant opportunities remain to improve the art of coaching using the creative sciences. As this paper's title says, one possible solution is to use the Torrance Incubation Model (TIM). But before we can explore this any further, we must be clear on what we mean by NDC and understand why there exists one big opportunity uniquely suited to using the TIM.

An Overview of NDC

NDC is a powerful coaching paradigm that actively balances our need for performance with our needs for learning and development that ultimately drive our ability to perform. It is the sum total of our past learning and development that lets us perform as we can today, and only our current learning and development that lets us perform better in the future.

NDC draws its philosophical basis from W. Tim Gallwey's work on helping people learn without actively teaching them. Gallwey (1974, 2000) discovered that the less he taught, the more his students learned if they focused intently on key elements of the task at hand. He proved this by taking absolute beginners through to competence in tennis instruction with very few lessons. These observations became the basis for his hugely influential *The Inner Game of Tennis* (1974). Gallwey's *The Inner Game of Work: Focus, Learning, Pleasure, and Mobility in the Workplace* (2000) applies Gallwey's philosophy in the workplace.

Miles Downey helped found the London School of Coaching, a leading proponent of NDC. His 2003 book *Effective Coaching: Lesson's from the Coach's Coach* is an early, comprehensive, and authoritative work in NDC.

While a complete explanation of NDC is beyond the present scope, the following information may give readers a better understanding of some key distinctions about what NDC is and how it works (excerpted and edited from *The Creative Coach* (McAlpine, 2011).

NDC – Key Distinctions:

Player vs. Client. Downey (2003) made a key distinction between the person being coached – the player – and the person who may be directing the overall effort (and is paying the bills) – the client. Essential for full-time coaches, it remains important for everyone else who coaches, as they must address explicitly the key components (e.g., level of care for the player, the intent of the coaching effort, etc.) of coaching (McAlpine, 2011).

Directive vs. Non-Directive Coaching. This is a critical distinction. Most of us grew up with a directive style of coaching when we played organized sports; this style differs significantly from Downey's (2003) non-directive approach to coaching.

Sports coaching is often our primary experience with "coaching" as an activity, yet sports coaching is highly directive; it is the epitome of the coach-as-expert, the one who transfers knowledge, who corrects and teaches proper technique, and who sanctions when necessary (Downey, 2003). NDC, by contrast, allows the player to set the pace and determine the path chosen to reach the desired goal.

Downey (2003) also noted that the educational system uses this knowledge-based expert model almost exclusively – another reason so many of us believe that directive coaching is the only possible way to help others learn and grow. Changing this directive paradigm was precisely one of the reasons why Torrance created the TIM (Torrance & Safter, 1990), so it appears both Torrance and Downey are addressing similar challenges in their respective fields.

Note: The directive approach is not *wrong* – Downey (2003) clearly believed that the appropriate coaching approach was the one providing the desired results (in their entirety, not just short-term results) (see Table 5). But directive is now not the *only* option.

Table 5: Coaching Spectrum Linking Coaching Styles to Associated Communication Activities:

Coaching Type	Definition	Communication Activities	Observations
Non-Directive (PULL)	Helping someone solve their own problems	Listening to Understand Reflecting Paraphrasing Summarizing	• Leaves ownership with the players + maximizes motivation • Encourages maximum learning • Often gets better results than anticipated, as performance is not capped by coach's knowledge & experience • May take longer to get to desired results, yet gets results *faster* in many cases due to reduced interference • Players start to self-coach themselves
Transitional (PUSH & PULL)	Mixing helping and directing	Asking Awareness-Raising Questions Making Suggestions Giving Feedback	• Provides a valuable middle-ground between non-directive and directive • Growth with Guidance – "junior employee friendly" yet not fully directive • May provide the *illusion* that one is using NDC with some sort of extra "touch of control", i.e. not NDC at all
Directive (PUSH)	Solving someone's problems for them	Offering Guidance Giving Advice Instructing	• Immediate results + high control • Robs players of real ownership + corrodes motivation • Rarely allows for upside surprises • Performance capped by coach's knowledge & experience

Note. Adapted from Downey, 2003, p.23. Copyright 2003 by Myles Downey. *Italicised* emphasis is the author's.

Yet, the directive style is so pervasive that both Downey (2003) – and this author – have seen people attempt to use it to teach others how to do a job that they themselves have never done! Obviously, the directive "coaches" in these examples were not knowledgeable, but felt they had to be or *pretend* to be authorities to get the other person to listen to them. Even when this approach's shortcomings were painfully obvious to everyone involved, they felt obliged to maintain the charade because *they had no idea how to act otherwise.* As with the TIM, some of learning how to coach is the unlearning of erroneous ways.

Mobility. Downey's (2003) non-directive coaching approaches mirror Gallwey's (2000) methods of guiding students through their own learning processes. Both focus on the concept of **mobility,** defined as being "the ability to move in any desired direction without self-constraint" (Gallwey, 2000, p.109). In other words, this is the ability to devote oneself fully to using one's innate creativity to solve problems, overcome challenges, and seize opportunities without interference (See Figure 2).

Potential – Interference = Performance. Downey (2003) subscribed to Gallwey's (2000) simple focusing formula on how to increase performance: reduce (or remove) interference. Too many coaches try to increase potential, thus fail. Gallwey stresses how even a little interference can drastically reduce performance (Gallwey, 2000, p.17).

Figure 2. Performance Equation. Adapted from Gallwey, 2000, p.17. Copyright 2000 by W. Timothy Gallwey.

Obviously, reducing a player's interference increases that player's mobility.

A New Challenge: The Role of Learning

Learning is one of Non-Directive Coaching's (NDC) key philosophical pillars. NDC requires the player to learn in order to make long-term, self-directed progress. In contrast, directive coaching limits learning to the knowledge that has been transferred directly from the coach; this virtually eliminates personal growth and any performance increases beyond the one-time transferred improvement.

Indeed, NDC is essentially a way to enable individuals to perform better, "… to learn for themselves, to think for themselves, and be creative" (Downey, 2003, pp. 9-10). NDC is designed to meet the significant challenge of maintaining a harmonious balance between performance, learning, and development, but it is silent on how to accelerate any of these three. McAlpine's *The Creative Coach* (2011) demonstrated how to incorporate much-needed creative rigor into coaching to accelerate performance while still maintaining that balance. It did not formally address learning or development.

One reason was that NDC explicitly advises coaches to avoid actively teaching, because most teaching approaches are *directive.* Yet, since learning is one of Downey's (2003) three pillars of coaching (the other two being development and performance), it seems incongruous to leave learning to happenstance.

How can coaches accelerate their players' learning without actively engaging in (traditionally directive) teaching? This is a conundrum requiring a creative response.

The creative solution: use the TIM.

The TIM as a Creative Solution to Accelerating Non-Directive Learning

The TIM can be used in two ways: 1) to teach creativity (skills within a creative thinking framework), and 2) to teach creatively (Murdock & Keller-Mathers, 2008; Torrance, 1979b).

So, if the TIM is a great way to teach creatively, can it be used to increase learning in a coaching situation where teaching is ***not*** the primary goal of the encounter, and is in fact actively discouraged from happening?

If so, how can a coach best use the TIM to creatively integrate "stealth learning" into coaching sessions?

TIM and Its Uses in Coaching

The TIM – Main Conceptual Stages and Strategies within Each Conceptual Stage

The TIM has three stages, a preliminary *Heightening the Anticipation* stage, a *Deepening Expectations* stage during the actual learning, and an *Extending the Learning* stage that encourages further application of the learning, thus enabling incubation afterwards. "Each stage is designed to promote a particular function in regard to learning and incubation" (Murdock & Keller-Mathers, 2002, p.4).

From a coaching perspective, *Heightening the Anticipation* strategies seem well suited to helping players become aware of being stuck. The Deepening Expectations strategies focus on helping players regain mobility, and the *Extending the Learning strategies* maintain the players' restored mobility.

Tables 8, 9, and 10 (from my unpublished manuscript; see reference list) present ways to use the TIM strategies in a coaching context. Examples and ideas are not prescriptive or exhaustive, just illustrative.

Heightening the Anticipation – Strategies for Use in Coaching

As mentioned, *Heightening the Anticipation* strategies seem well suited to helping players **become aware** of **being stuck.** *(Table 8)*

Note: Adapted from Torrance, 1979a. Copyright, 1979 by Creative Education Foundation; from Torrance & Safter, 1990. Copyright, 1990 Bearly Limited; and from Murdock & Keller-Mathers, 2002, pp.3-4, 10-12. Copyright NAGC Creativity Division. **Boldfaced** emphasis is the author's.

Deepening Expectations – Strategies for Use in Coaching

Deepening Expectations strategies focus on helping players **regain mobility.** *(Table 9)*

Note: Adapted from Torrance, 1979a. Copyright, 1979 by Creative Education Foundation; from Torrance & Safter, 1990. Copyright, 1990 by Bearly Limited; and from Murdock & Keller-Mathers, 2002, pp.3-4, 10-12. Copyright Creative Education Foundation. **Boldfaced** and *italicised* emphases are the author's.

Extending Learning – Strategies for Use in Coaching

Extending Learning strategies **maintain** the players' restored **mobility.** *(Table 10)*

Note: Adapted from Torrance, 1979a. Copyright, 1979 by Creative Education Foundation; from Torrance & Safter, 1990. Copyright, 1990 by Bearly Limited; and from Murdock & Keller-Mathers, 2002, pp.3-4, 10-12. Copyright Creative Education Foundation. **Boldfaced** emphasis is the author's.

Table 8: Heightening Anticipation Strategies and Their Possible Uses in Coaching

Cognitive Strategy	Possible Uses in Coaching
Create The Desire To Know	**When players are stuck and need to:** **move beyond "tried-and-true" answers** that have not / will not work now. Thus, players need to find new solutions and approaches. **Players must become aware of and confront ambiguities and uncertainties** surrounding their specific situation and in their surrounding environment in general. determine what more they need to know. **Players must be able to predict from limited information,** and where this fails to provide the necessary predictive power, focus their efforts on addressing any revealed gaps.
Heighten Anticipation and Expectation	**When players are stuck and need to:** **become aware of a problem to be solved or an opportunity to be met.** Coaches can help players identify performance shortfalls and other symptoms, information, and data that are clues to problems or opportunities. **develop a greater desire for solutions** by adding to their existing knowledge any unexpected learning from their present problems or opportunities. **warm up to divergent thinking and exploratory questions** that will occur in coaching sessions.
Get Attention	**When players are stuck and need to:** **heighten concern about unsolved problems or unmet opportunities** by becoming more aware of their impacts (more of the undesirable and less of the desirable, e.g. extra costs, higher staff turnover, lower revenue, etc.). **The bigger the impact, the more the player (and others) will pay attention** to the importance of solving the issue.
Arouse Curiosity	**When players are stuck and need to:** **look at the same information from different viewpoints** in order to get clues about hidden problems or opportunities. **arouse themselves to find answers by asking probing, provocative questions** vs. the same-old "safe questions" that are ineffective. **get** some **guidance** and **direction**, but **for whom directive input would be counter-productive** (i.e. undermine their motivation to solve the problem).
Tickle The Imagination	**When players are stuck and need to:** **take the time to re-evaluate what they know and what proof they have that they really know it.** Using imagination to look at things from different angles as if they were new and strange is a great way to validate or challenge past conclusions; also, tackling what was previously unknown is of great value in the search for new solutions.
Give Purpose and Motivation	**When players are stuck and need to:** **identify and learn about challenges and prepare to make changes.** Such efforts must always have purpose and be energized by motivation. To be creative, players need courage to move beyond what is known or what is comfortable into areas that may be dangerous to their positions or even careers – making changes may activate organizational immune systems. Ultimately, learning is worth it, as no one can "learn less" and any knowledge thus gained can lead to present and future breakthroughs.

Table 9:Deepening Expectations Strategies, Descriptions, and Their Possible Uses in Coaching

Cognitive Strategy	Description	Possible Uses in Coaching
Digging Deeper	Get beneath the surface to find what is glossed over or hidden	**When players are stuck because they:** superficially analyze or gloss over facts, events, or causations; find their solutions require constant and extensive rework. **To regain mobility, players must:** **master the information at hand.** Players must diagnose difficulties, integrate all available information (synthesizing and elaborating where necessary), and check information against hunches about causes or expected implications. **What is missing is sometimes as important as what is present.** learn viscerally that time spent dealing deep will save them many times that amount of time plus all the associated waste and frustrations when it comes to designing a solution.
Looking Twice	Defer judgement and keep open to new information & insights	**When players are stuck because they:** jump to conclusions based on initial information; reflexively climb the "ladder of inference" (Senge, 1990). **To regain mobility, players must:** **keep open to new information and insights by deferring judgment and searching for more information.** Coaches can invite players to try to understand situations from **other points of view,** and explore further the vision and ideas. Coaches should gently challenge players to move beyond initial acceptance of facts, their meanings and their implications. **extract more knowledge from previously known information** by re-evaluating information, causalities, symptoms, and implications. Sometimes, players who re-evaluate their sources of information discover unexpected differences in the accuracy of various people and other sources of information.
Listening for Smells	Feel congruence between two kinds of experiences: moving, visualizing, sounds (made or imagined) smelling, feeling textures, etc.	**When players are stuck because they:** see things from only one thinking approach (e.g. algorithmic); failed to understand others' motivations or needs. **To regain mobility, players must:** **make connections any way they can.** Players must strive to get some congruence between their experience related to the challenge and something else they know. Simple ways to achieve this is by **using multiple senses or actions** such as physical movement, visualization, imagining or making sounds, feeling textures or shapes, smelling, tasting, etc. Ideally, players would practice some form of synesthesia.
Listening / Talking to a Cat / Crossing Out Mistakes	Let the information talk to you or you to the information; read one's own feelings in response to the information; correct mistakes	**When players are stuck because they:** fail to be aware of relevant emotive or affective elements; are afraid to iterate – feel they have to get it all right the first time. **To regain mobility, players must:** **move beyond their preferred mode of reacting.** Players must interact cognitively, affectively, and emotionally with the information and its implications. This makes it much easier for them to understand their own feelings in response to the information, and it may increase their motivation to overcoming the challenge. **be ready to accept** that, by using their less used modes, t**hey may make more mistakes than usual,** as they are engaged in *approximate* thinking – close enough is good enough. Players must feel free to cross out mistakes, to make guesses, correct and refine where necessary, and even discard unpromising facts or solutions. Players must improve their solutions even at the risk of "breaking" them.

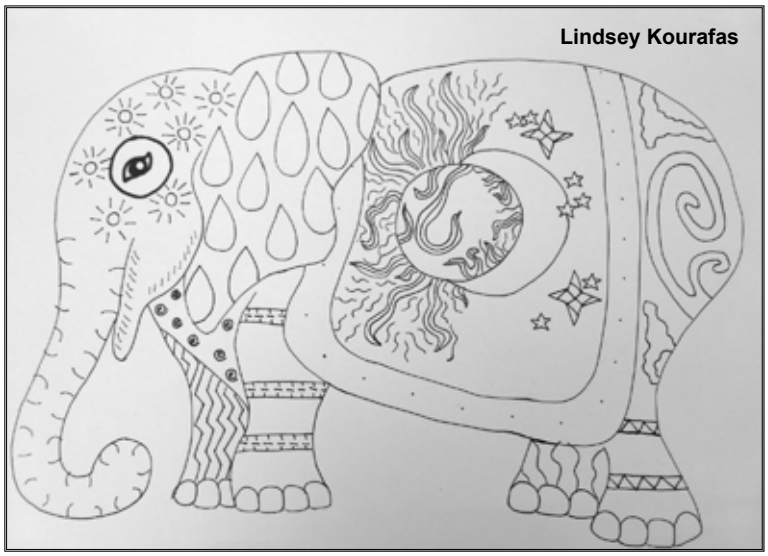
Table 9: Continued on next page

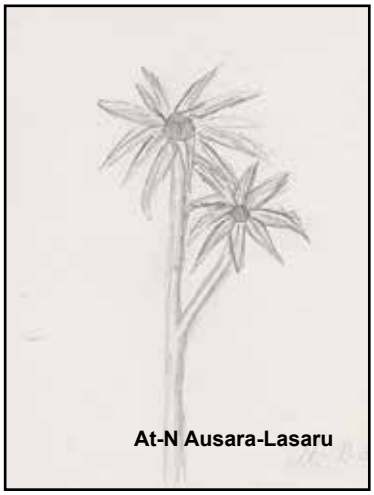
Table 9: (Continued) Deepening Expectations Strategies, Descriptions, and Their Possible Uses in Coaching

Cognitive Strategy	Description	Possible Uses in Coaching
Cutting Holes to See Through	Summarizing, getting the essence, simplifying	**When players are stuck because they:** get distracted and diverge too far from relevant details or elements of the problem being considered or solution being implemented; become overwhelmed, unable to see the forest for the trees. **To regain mobility, players must:** **get the essence** and **summarize** as if they were **writing a newspaper headline** or a half-page brief. This is highly convergent. **simplify and discard low-value, useless, or erroneous information.** This may require some tough decisions, but the payoff is a much easier time focusing on their interests and developing them. **focus** their thinking on the **specific information** that needs their attention at this moment.
Cutting Corners	Avoiding useless and irrelevant information; improve "best solutions" further	**When players are stuck because they:** are indecisive as to the exact nature of the problem; are indecisive as to a plan of implementation; need helping getting to the "next step" in their thinking. **To regain mobility, players must:** **decide on a clear statement of the problem,** one that permits players to get a clear vision of a solution and to understand the gaps between present and their vision of the future. Effort here will make it much easier to improve "best solutions" further and eventually determine an implementation plan. Coaches must **ensure that players take only intelligent risks** when "deleting" situational information. become more effective at **formulating challenges, solutions, and plans.** These are the three steps of CPS:TSM where players engage in more concrete thinking – in coaching terms, this is where players spend most of their time focusing on areas of interest (Puccio, Murdock, & Mance, 2007).
Getting in Deep Water	Searching for unanswered questions; dealing with taboos; confronting the unimaginable; being overwhelmed by complexity; becoming deeply absorbed	**When players are stuck because they:** play it safe, avoiding politics, "sacred cows," or "breaking eggs"; oversimplify to protect preferred solutions or to avoid being overwhelmed by complexity; refuse to be accountable and responsible when they need to be; are paralyzed by their fear of the "organizational immune system". **To regain mobility, players must:** **find the courage** to deal with taboo topics, search for unanswered questions, and confront the unimaginable. Coaches may need to reconnect players back into their original motivations and purposes to help them be courageous. be willing to be overwhelmed by complexity or to get so deeply absorbed as to be unaware of surrounding events – to **enter into a flow state** (Csikszentmihalyi, 1990, 2003). allow coaches to guide them (gently!) in using some Synectics analogical and metaphorical tools that can **make the familiar strange and the strange familiar** (Gordon, 1961; Prince, 1970). Thinking metaphorically is one of the best ways that players can figuratively creep up on a solution while bypassing internal censors that block linear, logical thinking. **be willing to be fired** (i.e., consider and even propose things that would get them fired if they were revealed in their raw state). This is especially true if they engage in metaphorical thinking and solution finding. **act as if they had a magic wand that could fix anything or remove any obstacle.** Even the most timid of players can play "make-believe" and confront the unimaginable when it is so obviously "not serious."

Table 9: (Continued) Deepening Expectations Strategies, Descriptions, and Their Possible Uses in Coaching

Cognitive Strategy	Description	Possible Uses in Coaching
Getting Out of Locked Doors	Solving the unsolvable; going beyond those "more and better of the same" solutions that make matters worse; opening up new vistas, new worlds	**When players are stuck because they:** Are afraid to move beyond the "tried-and-true" within their organization or industry; become limited by their own pasts or those of their organizations. **To regain mobility, players must:** **be willing to risk tackling the biggest, most intractable problems or opportunities by refusing to settle for what has been done before.** Players must want to make "second-order" changes, which was Torrance's way of describing significant, fundamental changes vs. the much more timid "first-order" changes that really are the "same old same old" (Torrance & Safter, 1999). **be willing to import strategies and tactics from other fields or industries**. All too often, players miss the most obvious of opportunities to look into other fields or industries to see if they may have found similar solutions to their challenges, or more interestingly, if some of their approaches may spark new ideas within the players. Sometimes, even elements from the natural world spark ideas (Benyus, 2002). ask: **"how might we…?"** This is **one of the most powerful of the CPS:TSM *statement starters*** because it throws the door open to any possible answer to the question (Miller, Vehar, Firestien, 2001). It does not make reference to what has existed or does now exist. **It is the ultimate blank slate** that many credit for innovative breakthroughs – it even had its own Harvard Business Review blog post (Berger, 2012).





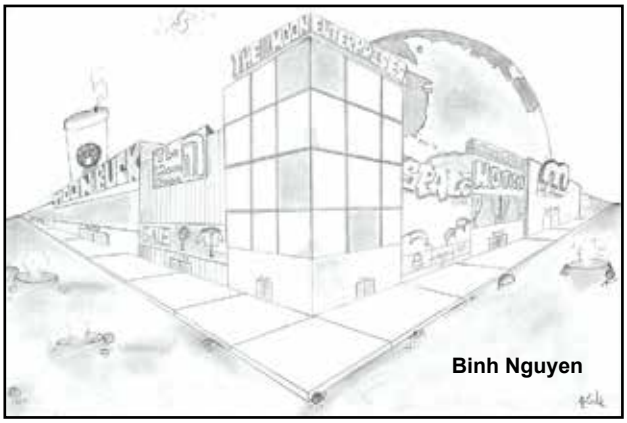


Table 10: Extending Learning Strategy Descriptions and Their Possible Uses in Coaching

Cognitive Strategy	Description	Possible Uses in Coaching
Having a Ball	Have fun; use humor, laughter, and fantasy	**When players may become stuck again because they:** begin to take things so seriously they resist making changes; have increasing trouble making lateral leaps (De Bono, 1970) in their thinking; start to become overwhelmed, unable to see the forest for the trees. **To maintain mobility, players must:** **be willing to be playful, to use humor, laughter, and fantasy** – all of these are just different ways of saying that the players are willing to experiment. Experiments always yield results – expected ones confirm what we know, unexpected ones lead to learning, which leads to seeing things differently, which lead to future creative changes. **embrace and enjoy the "absurdity of the situation"** (or parts of it) and see how their thoughts, feelings, and actions have contributed to said absurdity. Players are integral contributors to their worlds, and mobility is lost by denying this fact. **be willing to look now and in the future at the unexpected through the lens of humor.** Comedians are popular because they make the familiar in our everyday world strange and the strange familiar. Players who embrace this idea stay open longer and are more likely to make connections others may miss.
Singing in One's Own Key	give information personal meaning or relate it to personal experience; make associations; see implications for present or future problems or opportunities; use it to solve personal problems	**When players may become stuck again because they:** will not accept how many of their challenges and opportunities ultimately arise from them as individuals; return to playing it safe, avoiding politics, "sacred cows," or "breaking eggs;" refuse to be accountable and responsible or take ownership for the needed changes. **To maintain mobility, players must:** **align (to the extent possible) their own personal senses of purpose and motivation with those of their organizations.** Thus, players can focus fully on solving problems or opportunities. However, players must know their own motivations and purposes (their own keys) if they are to leverage them. The most creative people are self-motivated or in synergy with their world. **Sometimes finding or creating this synergy is itself a creative act,** a profound one that ignites a player's creative potential. **relate their work experiences to their own personal experiences.** This happens naturally to players who become parents – many see analogies between guiding staff and raising children. Players must not wait for biological happenstance – they must proactively connect themselves to their worlds. This is key to responsibility and accountability.
Building Sand Castles	imagine, fantasize, search for ideal solutions; "take off" from what has been encountered	**When players become stuck again because they:** find their past solutions require constant and extensive rework; start to shun expansive strategic thinking in favor of limited tactical thinking; need helping getting to the "next step" in their thinking; are afraid to keep moving beyond the "tried-and-true" within their organization or industry; fear that the "organizational immune system" may catch up with them. **To maintain mobility, players must:** **set meaningfully ambitious goals**. Timid goals lead to timid, inelegant solutions that rob everyone of the brilliant future that "could have been" – they are as dangerous as goals that are not set. **Coaches can help players remember when they set goals and actions that were "too big" yet drove amazing results**, and help players apply this mindset to set good goals. **recognise that big goals drive changes that require many other, related changes.** Some of these are the natural adjustments that afflict any real-world implementation. This means that **rework is an expected fact of life and not always a symptom of a failed plan or implementation.**

Table 10: Continued on next page

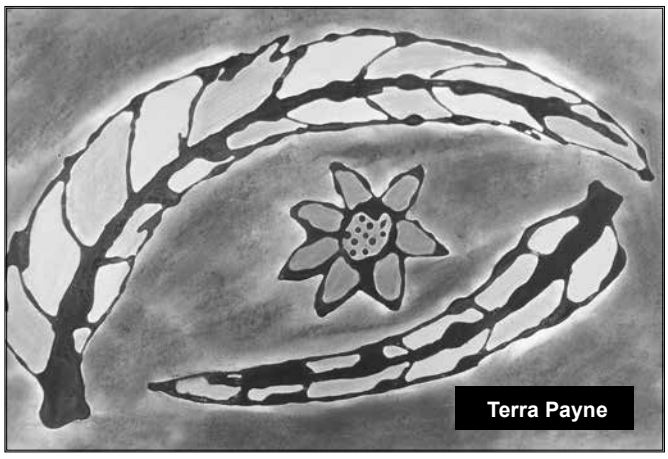
Table 10: (Continued) Extending Learning Strategy Descriptions and Their Possible Uses in Coaching in Coaching

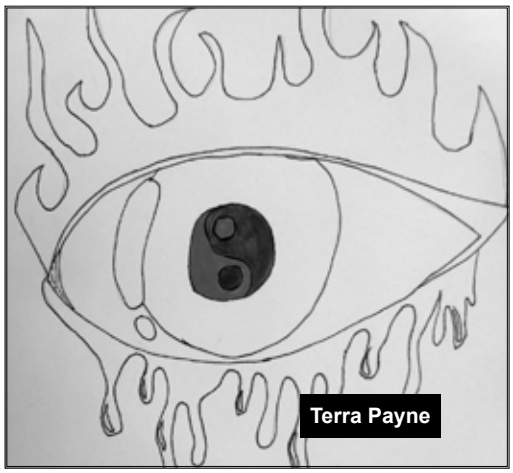
Cognitive Strategy	Description	Possible Uses in Coaching
Plugging in the Sun	work hard; find and use available resources, sources of energy or inspiration, rejuvenate	**When players may become stuck again because they:** are losing motivation to find a solution; refuse to be accountable and responsible or take ownership when it's necessary. **To maintain mobility, players must:** **understand that creative ideas can happen in a flash, but their realization into full solutions takes time and energy** in the planning and execution stages. Coaches can challenge players gently to explore yet more ways they can elaborate ideas, find allies and support in the development or execution of solutions, and/or find other ways for the player to connect to more resources, people, and inspiration. help players move away from limiting beliefs about **accountability** and **ownership** towards an understanding of how they can be positive forces for **change sustainability.**
Shaking Hands With Tomorrow	Enlarge, enrich, make more accurate images of the future; storing alternative solutions for possible future use; propose a solution of a future problem;	**When players may become stuck again because they:** are afraid to move beyond the "tried-and-true" within their organization or industry; become limited by an increasing awareness of their own or their organization's past. **To maintain mobility, players must:** **be willing to embrace a tomorrow that is positively different than today, based in part on their own efforts.** Seeing is a key to mobility, and a player's "image of the future is in a large measure what he (sic) is motivated to learn to do" (Torrance, 1979a, p. 32). This means that players are responsible for (their part of) the pace, magnitude, and direction of any changes. **realize that the tomorrow they will face is related to their today,** and that solutions or ideas that cannot yet be implemented may be feasible to implement tomorrow. Being on the lookout for ways to make today's unworkable changes happen tomorrow is a key ingredient for being "lucky."

Applying What You Have Learned

For an NDC coach, the use of TIM's strategies can help players learn (and develop) faster. The strategies are flexible enough to accommodate any personal style differences in coaches and in players. By design, how a coach implements any single TIM strategy is left open to each coach's discretion, allowing for an amazing variety of approaches limited only by experience or imagination. With 19 individual strategies to choose from, there is not a coach in the world who cannot benefit from incorporating the TIM into his or her personal coaching toolkit.

Whether you are a teacher working with students, an administrator trying to inspire growth in your teachers, a parent, or in any other official or non-official coaching situation, TIM is a tool that can support your work. TIM will not break, nor will it let you down. Use it lightly at first, and then more and more as you gain confidence. Use it as much as the players' needs call for it, and delight in the progress that you observe.





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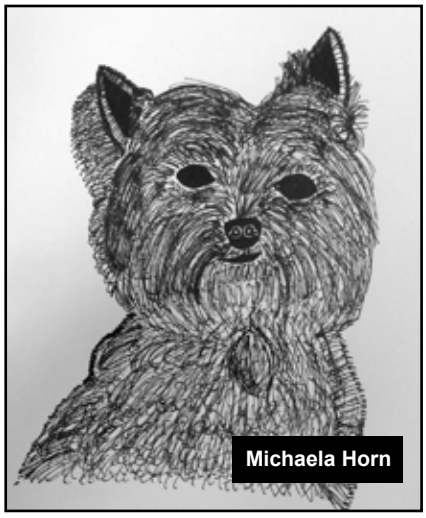
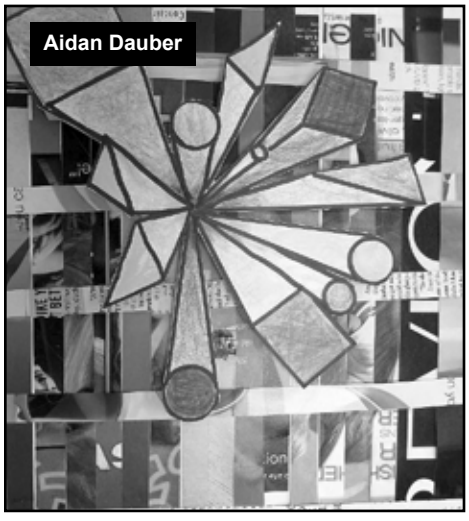




The KJ-Ho and The W-shaped Problem Solving Methodology and Its Application to Real World Problems

by Susumu Kunifuji

In Japan, by far the most popular creative problem-solving methodology using creative thinking is the Kawakita Jiro (KJ)-Ho method. This method puts unstructured information on a subject of interest into order by alternating divergent and convergent thinking steps. The W-shaped Problem Solving Methodology is an extended concept of the KJ-Ho to solve real world problems. In this article, I will explain the basic procedures associated with the KJ-Ho and the W-shaped Problem Solving methodology and its application to many real world problems.

1 Outline

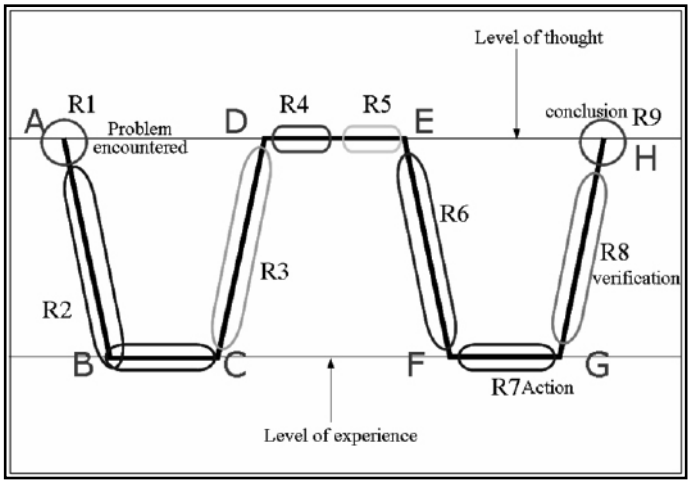


Fig. 1. The W-shaped Problem Solving methodology (Kawakita, 1991)

There are a number of creative thinking methods in existence, for example, brainstorming, brain-writing, mind-mapping, the KJ-Ho method (Kawakita, 1966), the NM method, and the Equivalent Transformation method. Human thinking processes for creative problem solving typically consist of four sub-processes: divergent thinking, convergent thinking, idea crystallization, and idea-verification. In Japan, the most popular creative thinking method by far is the KJ-Ho (Kunifuji, Kato, & Wierzbicki, 2007).

Jiro Kawakita (1991) explained that human creative problem solving processes often consist of the following steps (see Figure 1).

In a scientific inquiry, one encounters a problem at point A on the thought level. As the first step in solving this problem, he proceeds to explore the situation surrounding the problem between A and B, and next collects all relevant and accurate data through observation between B and C. By this data, he next formulates or develops a number of hypotheses between C and D. Having returned to the next level, at point D, he evaluates hypotheses and decides one hypothesis which to adopt. Between D and E, he infers and revises the adopted hypothesis through deductive reasoning. Next, he plans an experiment for testing the adopted hypothesis between E and F, and observes the experiment between F and G. Given the results of the experiments, he can verify hypothesis between points G and H, and can finally acquire a correct conclusion at point H.

The very original nature of the KJ-Ho is a bottom-up creative problem solving methodology for practical use (almost all other creative problem solving methodologies are top-down). The KJ-Ho was created on the basis of cultural anthropology and the W-shaped problem solving methodology, as depicted in Figure 1, providing a unique integration of social and natural sciences.

2. Basic Steps

Now we can explain basic procedures associated with the KJ-Ho. These are label making; label grouping; group label naming (nesting, grouping, and naming); spatial arrangement; relationships; and verbal or written explanation (see Figure 2).

Label Making

You initiate this process through brainstorming, brain writing, or idea marathon, as well as thinking and fieldwork. You collect data, observe situations related to the problem, and write down everything that you have discovered on labels. Only one fact, thought, or concept related to the problem of concern should be written on each label. There is no limit to the number of written labels.

Label Grouping

After writing up all facts, you should stack the labels and spread them around on a table or a floor. You must carefully consider what the labels are saying. Labels that appear to belong

together should be arranged close to each other and kept at a distance from other labels to form a group (or an island). Note that labels should not be grouped simply based on similarity (i.e. similar words being used), but rather on mental association. Labels that do not seem to be related to any other labels (called 'lone wolves') might become key concepts, or be merged into another group at a higher level of label grouping.

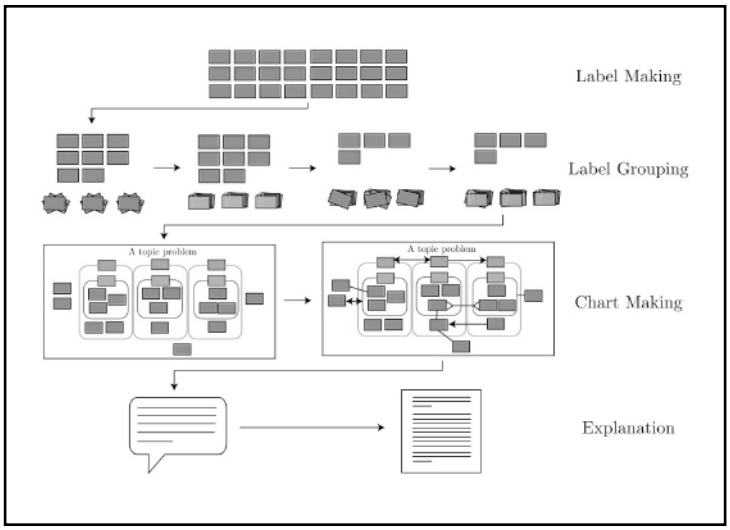


Fig. 2. Basic Steps of the KJ-Ho Method (Viriyayudhakorn)

Group Label Naming

After about two-thirds of the labels have been grouped, you can start making one-line headers (summarized sentences) as titles for each grouping. You should re-read all labels in the grouping and then think of a suitable title to describe the essence of all labels in that grouping. It should not be too abstract, nor too specific. Once a title is decided, you should write it on a new label, and perform this process until all groupings have been done. Making a one-line title is a concept creation or an abduction, which includes the meaning of all underlying labels in the group. This process of label grouping and label naming is repeated until the number of groupings becomes less than about 10.

Spatial Arrangement

After several label grouping steps, a bundle of final groupings are obtained, which are to be spatially spread and arranged on a large sheet of paper. You should consider carefully a stable, meaningful arrangement of all labels and groupings. This process will continue until all labels and groups are placed using the same justification recursively.

Relationships

Labels, groups, teams, and islands are often called objects. Typically, the following relationship symbols are used in KJ-Ho chart making between objects:

(a) Cause and effect: One is a predecessor or a cause of another.

(b) Contradiction: Objects are conflicting to each other.

(c) Interdependence: Objects are dependent on each other.

(d) Correlation: Both objects relate to one another in some way.

Relationships among objects in the chart must be easily and clearly expressed.

Verbal or Written Explanation

The last step is to explain the chart clearly. The explanation should begin with a general scenario of the problem, and then be more specific. Usually, the verbal explanation is given first, which could start from any position on the chart, and then proceed to an adjacent part until all parts are covered. After this, the written explanation is performed. You should write down the verbal explanation, making it clear, smooth and concise. This step helps the audience to understand the interrelationships among components of the problem thoroughly. The written explanation of the chart (that is called Type A) is called the KJ-Ho Type B and the verbal one that is preliminary is the KJ-Ho Type B'.

3 W-shaped Problem Solving

The KJ-Ho is a creative problem-solving methodology using creative thinking that puts unstructured information on a subject matter of interest into order through divergent and convergent thinking steps. As it was briefly mentioned in the introduction, the process model of the KJ-Ho (the cumulative KJ-Ho) is called 'W-shaped problem-solving' from Round 1 to Round 9 as follows (see Figure 1).

Round 1: Presenting a given problem by clarifying the given task. Data is collected by recalling from memory, rather than from external investigations.

Round 2: Understanding the status quo of the given problem (i.e., understanding the current situation). Data is collected by fieldwork or observations from a 360 degree viewpoint.

Round 3: Generating hypothesis. This round is most important because we must find new hypotheses or ideas to solve the given problem by the KJ-Ho. Note that if generated sentences (hypotheses or ideas) are in a negative form, then it is better to restate these as positive

sentences. This is called the nega-posi transformation.

Round 3.5: After evaluating hypotheses or ideas by both subjective and objective judgments, you choose the most effective hypothesis to solve the given problem, which is in effect a decision making or policy determination. This evaluation sub-process is often done by all participants, and sometimes called a highlighting or scoring process.

Round 4: Forming a grand plan (i.e., formulating a master plan for more detailed investigations).

Round 5: Forming a detailed plan (i.e., an implementation strategy for the problem).

Round 6: Establishing a practical procedure by using PERT (Program Evaluation and Review Technique) or workflow.

Round 7: Practical actions to verify the hypothesis.

Round 8: Verification by testing. If the hypothesis is rejected, then retry another hypothesis generation by backtracking to Round 3.5. If it is acceptable, move to next Round 9. If all hypotheses are rejected, then go back to the checkpoint of Round 1.

Round 9: Conclusion and Reflection process. Accepted hypothesis must be added to our knowledge base.

4 Case Studies of the W-shaped Problem Solving Methodology

There are many applications of the W-shaped problem solving methodology in Japan.They are the Nomadic University, the mini Nomadic University, TQC and KAIZEN, regional development, health care workshop, design thinking workshop, psychotherapy, environment problem, and so forth. In this chapter, we explore the mini Nomadic University projects in detail.

The Nomadic University (Kawakita 1971a, 1971b) is a form of project where the cumulative KJ-Ho as a W-shaped problem solving methodology is applied to a specific problem. These Nomadic Universities are typically held at the locations where the problems exist. The first Nomadic University was founded by Professor Jiro Kawakita (Professor at Tokyo Institute of Technology) in August 1969, in Kurohime, Nagano, in the midst of student uprisings in Japan. This first event was called the Kurohime Nomadic University (Kawakita, 1971a), a two-week workshop in an outdoor campus, with attendants staying in tents. The author participated in this first event and this series continued to be held 25 times in Japan up until 1999.

The Japan Advanced Institute of Science and Technology (JAIST) is the first national graduate school without undergraduate school in Japan. JAIST has three schools—the school of information science, school of material science, and school of knowledge science. As the author was a professor of the school of knowledge science, he started to lecture on an introduction to the KJ-Ho and the W-shaped problem solving methodology from 1998.

All students wanted to restart the Nomadic University, but the two-week workshop is too long as one lecture. Then, we started the second generation Nomadic University, which is called the mini Nomadic University (Naganobu et al., 2012); "mini" means a shorter four- to six-day workshop. From 2008, it still takes place today in Japan, covering a very wide city of Ishikawa Prefecture (e.g., Hakusan City, Nanao City, Nishiura Town, and Nomi City).

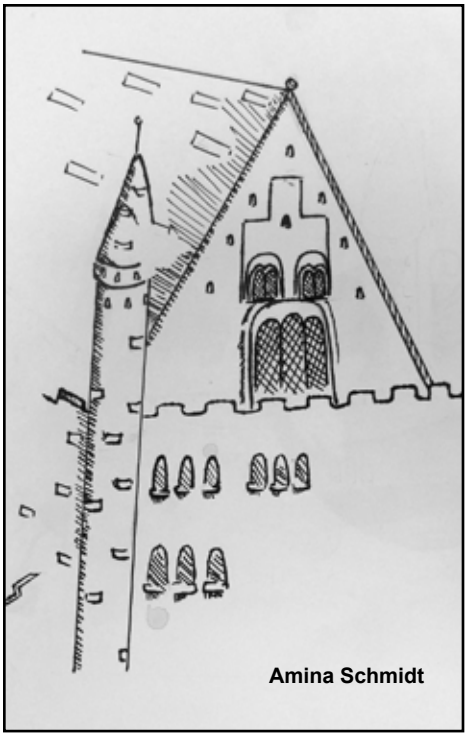
JAIST is located in Nomi City, Ishikawa Prefecture, on the Japan Sea side of the mainland, Honshu. Nomi City got city status in 2005 by combining a few neighboring villages. Nomi City currently suffers from an aging and decreasing population. From 2012, the local government and JAIST agreed to open a four-day mini Nomadic University.

Preliminary Session

One month prior to the main session, there was a short preliminary meeting among the university, local government, and residents to discuss the issues, where 5 to 10 members participated. First, the author gave a talk on regeneration, stressing that it is a process to be jointly conducted by the local residents and local government. This is in contrast to the usual expectation of residents, who typically think that the local authorities will resolve any issues. Instead, the residents are very much expected to demonstrate their initiative and creativity, going through a problem solving cycle of idea creation, planning, implementation, verification, evaluation and identification of issues, by themselves.

Main Session

The first day of the mini Nomadic University consisted of an introduction to the project background for all students and several professors of JAIST (i.e. the main investigators of the project); conducting pre-fieldwork by the students visiting the villages concerned; and generating an impression map of the village by the students. In the evening, there was a meeting to share with the residents how the outsiders (students) perceive the village. A final evaluation list is made by the residents.



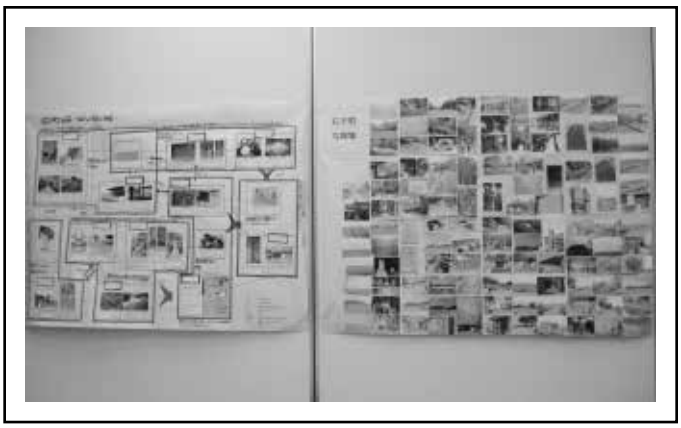


Fig. 3. The Photo KJ-Ho and the rest of photos

The second day, all students visited the villages and took photos by guiding the representative of the village. The photos are candidates of the village treasures. In the evening, all students try to make the Photo KJ-Ho. It shows understanding the status quo of the given problem (i.e., the current situation map).

The third day, all students continue to observe the Photo KJ-Ho and get many ideas for regional regeneration. They make an idea illustration map about possible recommendations of the village.

The fourth and last day consisted of further refinements of the recommendations. In the evening, we set up the second workshop. All students, the residents, and the local government attend the workshop. The first presentation of the idea illustration map is done by the students, which is the outsiders' opinion. The residents and students discuss the recommendations, but evaluations are done by the residents themselves. This is the most important. After the evaluation, the plan for the village's regeneration is presented by the residents.

Fig. 4. "Karuta" in Nomi City

After Session

The idea illustration maps and the Photo KJ-Ho maps are exhibited at the local community center. The student representatives are invited to the village meeting. Several recommendation plans are put into practice by the residents. They are as follows:

One village established an NGO to pursue this regeneration project—in particular, to improve inter-generational interactions through learning. More detailed plans are still in progress.

Another village has a troublesome problem of increasing numbers of wild boar. Students interested in the matter established a venture business company. They are now considering a business model that would generate money for wild boar meat and tanned skin. They are very active.

The other village has proposed a village "karuta" game by the students. "Karuta" is a set composed of cards with texts to be read and corresponding picture cards. The village children enjoyed the village "karuta" at the summer festival.

5 Concluding Remarks

We explained The KJ-Ho and The W-shaped problem solving methodology, and its application to real world problems. There are many applications of The KJ-Ho in Japan. They are KAIZEN (i.e., "Continuous Improvement"), TQC (i.e., "Total Quality Control"), Requirement Engineering, Creative Education, Social Innovation, Artifact Creation, Care/Nursing Workshop, Design Thinking, and so forth. The most successful application is the mini Nomadic University for Regional Invigoration.

The KJ-Ho is a most popular creative design thinking method in Japan. In fact, my students studied the KJ-Ho and The W-shaped problem solving methodology. Thirty-one students in my lab were awarded with their Ph. D.'s and all doctors got tenure positions. One hundred three students in my lab got their master's degrees. They researched and developed many innovative software tools and devices. They are RFID (i.e., radio-frequency identification) mat, Aroma Chips, Decision Making Support Groupware, Brain Writing Support Systems, Group KJ Ho Support Systems, and so on.

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IV. Creative Applications: Arts, Humanities, and Sciences

Jaeweon Ryu

Connie Phelps
Cornerstones in Applied Creativity: Torrance Jet Aces and Spolin Theater Games

Jerry Flack
C.C. Equals Creative Catalogs

Barbara A. Kerr & Nicole M. Farmer
A Place of Their Own: The Role of Makerspaces and STEAM Labs in Developing the Talents of Creative Students

Joy C. Phillips & Jen Katz-Buonincontro
Drawing While Talking and Thinking: Exploring the Intersection Between Creativity and Imagination

Harry T. Roman
Relevance in the Gifted Classroom—Connecting Our Students to the World

Linda M. Speranza
Creative Thinking and Its Development in the Studio Art Classroom

Robin Lynn Treptow
Creativity and Innovation in an Interdisciplinary and Multicultural World: Culinary Ingenuity for Health's Sake

Cornerstones in Applied Creativity: Torrance Jet Aces and Spolin Theater Games

by Connie Phelps

What points of commonality exist between the jet ace research by E. Paul Torrance and Theater Games developed by Viola Spolin? Primarily, these pioneers in creativity provided an impetus that transformed aspects of their respective fields in psychology and theatre. Known as the "Father of Modern Creativity", Torrance (1915-2003) found similarities between the jet aces of the Korean War (1950-1953) and creative persons when he directed Survival Research in the United States Air Force (USAF) from 1951-1957. From this point onward in his career, Torrance focused his research on creativity (Hébert, Cramond, Neumeister, Millar, & Silvian, 2002). Often referred to as the "High Priestess of Improvisational Theater", Viola Spolin (1906-1994) attended the Recreational Training School at Hull House in Chicago from 1924-1926. Under the direction of sociologist Neva Boyd, Hull House training included experimental theatre and play theory to assist European immigrants with language and social skills (Joseph, 2010). These settlement house experiences influenced Spolin and her seminal work, *Improvisation for the Theater* (1963, 1983), and its companion publication, *Viola Spolin Theater Game File* (1975, 1989).

Emerging from academic research and performing arts domains, the impact from Torrance's jet ace research and Spolin's Theater Games on applied creativity reaches worldwide with applications in training centers, innovative programs, and talent development. Aspects of creativity common to these cornerstone accomplishments include risk-taking, problem-solving, transformation, and play. Examining elements of creative definitions, processes, and products between these two widely divergent fields seems relevant to a holistic approach to applied creativity.

Amina Schmidt

Risk-Taking and the Rules of the Game

In 1951, Torrance was appointed Director of Survival Research in the USAF located in Colorado. The seven productive years that Torrance worked as a survival psychologist in the USAF marked the emergence of creativity in his career (Hébert et al, 2002). Torrance and his research team found seven skills essential to survival: inventiveness, creativity, imagination, originality, flexibility, decision-making, and courage. These abilities formed the foundation of his research in creativity (Smutny, 1996, p. 419). His survival research included a profile of Korean War jet aces as independent and committed airmen who met life head-on and courageously took risks. Torrance described these highly disciplined airmen as "wild colts" with creative responses on the Rorschach Inkblot Test and Risk-Taking Scale (as cited in Hébert et al, 2002). Jet aces used their creativity productively, and they knew the rules of the game in jet-to-jet combat in order to take strategic risks and avoid placing themselves at a disadvantage with the enemy (Sherman, 1998).

Spolin Theater Games take inspiration from Boyd's training program based on creative group play at Hull House (Spolin, 1983). Designed to train workers with immigrants, the curriculum covered theoretical, technical, dramatic, supervision and administration, and social treatment coursework (Simon, 2011). Boyd (n. d.) found true spontaneous play occurred when participants engaged themselves behaviorally and psychologically into the activity for doing so. At Hull House, Spolin learned to stimulate creative expression in chil-

dren and adults through games, storytelling, folk dance, and drama. When Spolin (1983) taught and supervised creative dramatics at the Works Progress Administration (WPA) Recreational Project in Chicago, she developed theater games to overcome ethnic barriers. These games became the building blocks of Spolin Theater Games (Jewish Women's Archives, n. d.). Spolin defined game as "an accepted group activity which is limited by rules and group agreement … a set of rules that keeps a player playing" (1983, p. 382). Her formulaic definition for *rules of the game* began with the *where, who and what* and *object* (point of focus) plus *group agreement.* Spolin Theater Games relied on structures that require active responses from players without rehearsed lines and a minimal or absence of direction. Spolin distinguished between *theater games* as group play with agreed upon rules and *improvisation* as the process of playing the game or solving a problem together through intuition (1983).

Problem-Solving for the Unknown

In 1952, Torrance and his United States Air Force (USAF) research team taught groups of combat airmen survival skills in extreme conditions and emergencies in Reno, Nevada. In 1953, Torrance conducted survival research on jet aces (Hébert et al, 2002) who distinguished themselves during the Korean War (1950-1953) with its aggressive air-to-air combats. By definition, an *ace* is a military pilot who has shot down five enemy planes during combat (Maksel, 2008). Torrance realized the essential role of creative skills for exceptional accomplishment (Hébert et al, 2002). In 1957, he developed his briefest and what he considered his most satisfying definition of creativity (Shaughnessy, 1998): "whenever one is faced with a problem for which he has no practiced or learned solution, some degree of creativity is required" (Millar, 1995, p. 39).

Whereas the Korean War jet aces engaged the enemy in jet-to-jet combat, Spolin trained players to solve problems creatively in another kind of "space." Spolin considered any game worth playing highly social. Embedded with a problem that needs solving, Spolin Theater Games required players to get out of their heads and into the space, and to do so within a non-authoritarian atmosphere without right or wrong solutions to a dramatic problem (Spolin, 1983). Spolin asked players, "Where are you?" so they would use their *space work* to "create" objects in their environment (Sweet, 2010). Based on cooperation, listening, and an empathetic imagination, theater games functioned within a democratic context. Anyone could participate in these structured games that solve problems through a seeking process rather than finding winners or losers. Spontaneous and immediate, theater games require intuition or *X-area* beyond the intellect or memory to inspire problem-solving. Spolin defines creation as that which happens when players *create* from the limited plus *intuit* from the unlimited (Spolin, 1983). Intuition occurs outside formal thinking processes, and the *X area* provides an inexhaustible source where players can discover new things that emerge from the unknown (Veenstra & Warzecha, 1987)

Transformation and Creativity

During the Korean War, the USAF airmen flew the legendary F-86 Sabre wing fighter to combat the MiG-15 in jet-to-jet combat with a kill ration of 10:1 (Puckett, 2005). MiG Alley combats along the Yalu River into the Yellow Sea produced USAF triple aces Major James Jabara with 15 victories and the first jet-to-jet ace as well as Captain Joseph C. McConnell, the all-time highest scoring American jet ace with 16 victories during a four-month period in 1953. In all the United States military forces, 40 servicemen achieved jet ace status during the Korean War (Werrell, 2005). Torrance conducted a six-month study of 31 of the 38 jet aces who shot down over a third of the MiGs during the Korean War. Compared with 62 non-jet ace pilots, Torrance found the jet aces possessed a passionate, single focus for flying. They functioned best when given some leeway from regulations, and they typically came from large families where they needed to cooperate with siblings and struggle for parental attention. Jet aces took on additional tours of duty, and they flew faster and higher than ordered. In their younger years, they played rough contact sports aggressively to win, and they skipped school or drove cars to test the limits (*Time,* 1954). The USAF training simulated survival exercises, shared success stories of POW escapes, and provided strategies to use when lost at sea, shot down in enemy territory, or lacking basic food or shelter. However, real survival situations presented airmen with new experiences beyond known and practiced solutions. Whereas elements of creativity are teachable, Torrance realized true creativity is always untaught as it imaginatively reconfigures the known into the unknown through self-discovery and self-discipline (Shaughnessy, 1998).

Spolin believed creativity consisted of more than cleverly rearranging basic components of the known, as it must also transform the person. She defined *transformation* as creation, a momentary breaking through the isolation with an "ahhh!" effect on both players and audience when a new reality appears (1983, p. 394). *Transformation* arises from the *physicalization* of movement and *exchange of energy* in the space between players (Spolin, 1989). Considered the heart of improvisation, transformation re-forms the player beyond the limitation of the known in the here and now. Theater Games also transform small groups when each player enthusiastically agrees on the rules of the game, and the group works together without an external authority. Players accept similarities and differences within the group, and each player participates to the fullest capacity possible in a non-competitive environment. The level of a player's *energy* responds to the problem, and *inspiration* occurs when players solve the problem (Spolin, 1983).

The Play is the Thing

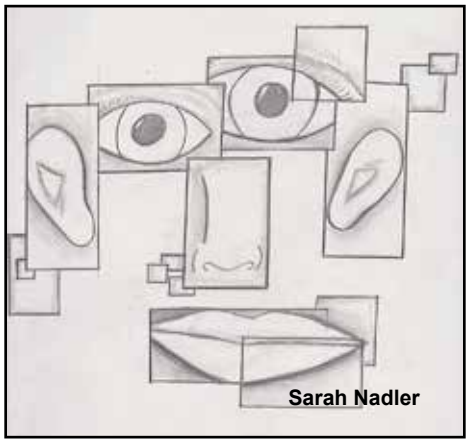
As Director of Survival Research in the USAF, Torrance recognized the importance of "experiential learning, cooperative learning in small groups, learning in all modalities, tolerance of disagreement in groups, [and] the extreme importance of motivation and creative thinking" (as cited in Hébert et al, 2002, p. 8). In Reno, Nevada, Torrance and his research team taught the psychology of survival to new groups of airmen who arrived every 17 days. Training exercises ranged from missiles to Distant Early Warning (DEW) line teams (Hébert et al, 2002). Korean War jet ace Frederick C. "Boots" Blesse described the critical nature of rigorous training, discipline, and leadership during actual combat. F-86 airmen worked together in four-man teams with experienced airmen as flight and element leaders and newer airmen as their wingmen. With leaders designated as shooters and their wingmen as lookers, the leaders and their wingmen might split their formation from four to two airmen. However, they always flew in pairs as leader and wingman. After about 15 missions, leaders could spot potential leaders among the wingmen who then received grueling tactical training in the air with tight turns and rolls (Sherman, 1998).

Spolin implemented theater games such as *Gibberish* with its non-symbol speech to prompt players toward expressive speech and gestures (Sweet, 2010). Freed from many technical aspects in the environment, players gained more spontaneous and natural movement (Spolin, 1983). Each Spolin Theater Game included a *point of focus* such as *communicating to an audience.* With its nine variations, *Gibberish* transformed the *where* of a game by substituting meaningless sounds for recognizable speech, similar to the Swedish Chef Muppet character. Spolin used side coaching, rather than stage blocking or direction, to support players during the game. For example, the *Gibberish Selling* game required a player to sell something directly to the audience while Spolin side coached: *Sell it directly to us! See us!* To evaluate a player, Spolin asked reflective questions rather than critiquing a player. *Was there variety in the gibberish? Did the player see the audience or stare at them?* (Spolin, 1983, p. 123). In the *Mirror* exercise, Player A served as a "mirror" for the facial expressions and movements of Player B until Spolin side coached with *Change!* Player B then became the mirror for Player A's movements and expressions (1983, p. 60).

Living Legacies and Talent Development

The jet ace study in the USAF propelled Torrance into a lifelong study of creativity with enduring impact, and Spolin's creative group play training at Hull House ignited the first generation of modern American improvisation. Torrance became a prolific writer and researcher who developed the Torrance Tests of Creative Thinking, Future Problem Solving Program, Incubation Model of Teaching, and Torrance Center for Creative Studies. After three decades of teaching theater games, Spolin wrote the seminal *Improvisation for the Theater: A Handbook of Teaching and Directing Techniques* (1963, 1983) and the *Viola Spolin Theater Game File* (1975, 1989) as a resource for classroom teachers. Torrance's multi-faceted career directly impacted students, colleagues, and friends; and his contributions indirectly influence millions more throughout the world (Kaufman & Baer, 2006). Spolin Theater Games form an American art genre widely used for workshops in theaters and schools, and popularized by The Second City in Chicago where Spolin's son, Paul Sills, served as the original director. A long list of renowned players associated with The Second City includes Gilda Radner, Tina Fey, Dan Aykroyd, and John Belushi (The Second City, 2015).

Both Torrance and Spolin appreciated creative playfulness, and they created small groups in their teaching with great success. Similarities between the *Four Ps* of person, process, product, and press (environment) in creativity theory and the *who, what, and where* of dramatic group play demonstrate the universality of principles related to applied creativity. Moreover, Torrance believed that the best predictor of success could be a person's self-image and passion for future work (Torrance, 1987). The cornerstone works of Torrance's jet ace research and Spolin's Theater Games seem to validate this predictor and underscore the importance of creativity applied to daily living for everyone.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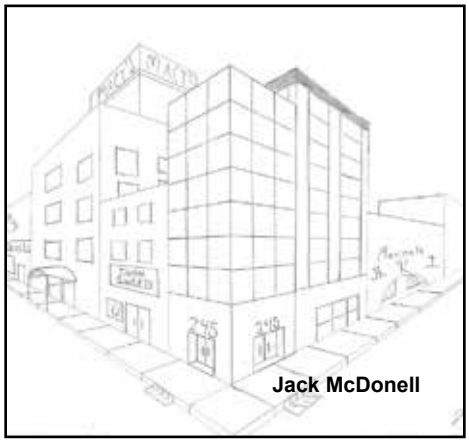
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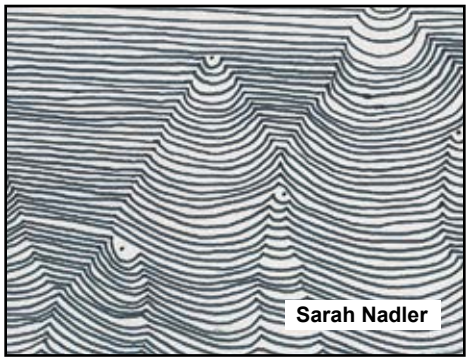
Sarah Nadler

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"What am I Doing?" Improvisation Game

Sarah Mahoney (left) and Sarah Jean Robinson (right) of Lawrence, Kansas, demonstrate What am I Doing? an improvisation game based on disassociation. Although she mimes "riding a bike," when asked by the next player, "What are you doing?" she responds, "brushing my teeth." The asking player then mimes "brushing my teeth" to the next person in the game. When asked the question, the process repeats with a response dissociated from the action.

C. C. Equals Creative Catalogs

by Jerry Flack

Introduction

I have long believed that creativity flourishes in richly colorful and stimulating classroom environments. I have also been a life-long pack rat who cannot pass up "treasures" that more temperate and tidy persons discard. I speak here especially of catalogs and related wall posters that weary mail carriers gladly cast off. One or more tables in my media-saturated classroom were always filled with catalogs from a great variety of commercial mail-order vendors plus additional wonders found on weekend "Catalog Treks." Samples of the former included catalogs of children's book publishers, exotic travel companies, clothing outlets, candy companies, holiday extragavanzas, and just plain fun nostalgia tomes such as those of The Vermont Country Store. Weekend catalog collecting searches found the author visiting automobile sales agencies, local department stores, chain store outlets, unusual or one-of-a-kind businesses located in malls, and even gathering up the ubiquitous real estate catalogs at exits of local grocery stores. Teachers and students who live near art communities may well find Collector's and ArtScape Guide catalogs filled with gorgeous reproductions of the paintings and sculptures of artists represented in local art galleries.

Sample Mail-Order Catalogs

Venice Simplon-Orient Express
Neiman Marcus's "The Christmas Book"
National Geographic Expeditions
Candlewick Press
Wilderness Travel's Cruise Collection
Grand European Travel
Viking River Cruises
See's Candies
Burpee Seeds & Plants
LEGO
The Cook's Garden

Sample Catalogs Found While Shopping at the Mall

William Sonoma
Nordstrom's
Eddie Bauer
Patagonia
Neiman Marcus
Robert Talbott
American Girl
Mercedes-Benz

Increasingly, many businesses that once published print catalogs have gone online.
Sample Online Catalogs

The Apple Store
The Disney Store
Toys to Grow On
Gump's (San Francisco)
Robert Redford's Sundance Catalog
R. Crusoe & Son Hosted Journeys (around the world)
Fisher-Price Toys
Fat Brain Toys
MindWare
Cabelas
Tree House Humane Society

Please Note. In order to receive hard copy catalog samples from a majority of online mail-order businesses, it is necessary to provide personal information that includes email addresses. One unprincipled means of making money for some companies is to sell email addresses. Unless families or classrooms want tons of electronic junk mail, be certain that businesses do not engage in such practices. A second caution is to use care in the Internet catalog search words utilized. A search for "unusual mail-order catalogs" might end up with online leads to companies such as Victoria's Secret or other adult fare that is far from what students need. More accurate word search terms or phrases would be "children's catalogs" and "toy catalogs"

As students enjoy their immersion into the world of catalogs, solicit from them some of the common features of most catalogs. Catalogs are visually rich and colorful. Typically, several items are displayed on each page and items are grouped by categories (e.g., clothing, toys, books). Most catalogs are models of good writing. Strong action verbs and colorful adjectives are used by copy writers to create positive images in the minds of readers. Precision is characteristic of the text. Copywriters realize that they have limited space to convey vital information about any given product. They use language judiciously.

A serendipitous bonus of student-generated creative catalogs is the improvement and refinement of writing skills. Even verbally gifted students can benefit by noting the clarity, precision, and conciseness of the technical writing found in catalogs. Writing copy for their own catalogs engages students in writing that requires them to focus on the

precise use of words. Moreover, much of the copy for catalog entries describes in detail how a catalog item works or is operated. Some of the critical elements of catalogs include flattering drawings or photographs, adulatory descriptions, special features, materials, dimensions, colors and sizes, order numbers, and prices. Remind students that any catalog is measured by its overall attractiveness, organization, and creativity.

Once students have surveyed a wide array of catalogs, they can create their own. The selection of themes or topics for student-generated catalogs is unlimited and creating them significantly enhances the creative productivity of gifted learners.

Students' own catalogs have much in common with equally original alphabet books. A generic pattern or rubric is shared with talented students. Once they have studied several catalogs, they will have a good idea of what is expected of them in order to achieve creative success. How students respond to the challenge of creating their own original catalogs is largely a matter of their personal creativity and task commitment.

Classic Catalogs

Catalogs are designed to stimulate customer desire so it is not surprising that many catalogs are beautiful to behold. Even given the hundreds, perhaps thousands, of catalogs that have played a significant role in American free enterprise, there are at least two or three catalogs that would easily rank very high if America had a "Catalog Hall of Fame."

The Neiman Marcus *Christmas Book* has become an institution as well as a monument to extravagance and conspicuous consumption. One can only imagine the fun brainstorming sessions the catalog's editors have selecting items to truly amaze readers. Some of the incredible items, always dramatically photographed and lavishly described with prose that borders on poetry, have included a Napoleonic Faberge Egg, a Limited Edition Bell Helicopter, a $600 Monopoly game made up of the finest chocolates in the world. (Obviously, the game is not for repeated playings.) One special culinary delight is an exclusive gingerbread house, a mirror image of the owner's home (mansion?). his and her gifts are popular items in NM's *Christmas Book*. Some examples include his and her matching dirigibles and Hummer mountain bikes, two multi-function robots, and a pair of ostriches. The Neiman Marcus Christmas Book is available from selected store outlets typically in early November.

In 1888, Richard Sears published his first mail-order catalog. Not long after, Sears' chief cross-town (Chicago) rival, Montgomery Ward & Co., joined in producing yet another "Wish Book" for the rapidly expanding populations in the rural regions of the United Sates. (Note: Both Sears and Montgomery Ward used "catalogue" as the choice of spelling for their merchandise tomes.) These two giant mail-order merchants offered as many as 6,000 items pictured on more than 700 pages of catalog wonders that ranged from corsets to Zulu guns, buggy whips, watches, sewing machines, brass beds, bicycles, Bibles, band instruments, beehives and even banjos. Merchandise for babies included bonnets, diapers, and baby carriages and tombstones could be purchased from Sears, Roebuck for those who anticipated the opposite end of the age spectrum.

The table of contents of the *1897 Sears, Roebuck Catalogue* alone is fascinating. Catalog chapters include groceries, drugs, tools, refrigerators, bells, stoves and household utensils, agricultural implements, boots, shoes, and rubbers, trunks, dry goods department, women and girls clothing, men and boys clothing, carpets, curtains, and linens, silverware, clocks, optical goods, surveyors' instruments, thermometers and electrical goods, cameras, musical department, sporting goods, furniture, and harnesses and saddlery.

The 1908 "Big Book," one nickname for the annual Sears catalog, offered construction materials and plans for building a three-bedroom house for just $725.00.

Sadly, the final Sears catalog or "Wish Book" was published in 1933. It was the height of the Great Depression; banks had failed and hundreds of thousands of farm families lost their homesteads. In small town rural America, the population could no longer order from the "Wish Books."

The Sears, Roebuck and Montgomery Ward catalogs are available in facsimile editions from local libraries and selected reproductions of these "Wish Books" are also available for purchase from contemporary online or mail-order businesses from today's catalog giants such as Amazon.com.

Ironically, Amazon.com is a 21st-century electronic version of the original Sears and Montgomery Ward "Wish Books." A brief look at the Amazon.com category purchase lists 40 + chapters. Some categories such as home appliances, clothing, shoes, jewelry, groceries, luggage, pet (animal) supplies, home and kitchen items, and tools for home improvement might seem familiar to first-time readers of a Sears 1897 "Wish Book." Yet those same readers might well find CD & vinyl, digital music, electronics, gourmet foods, luxury beauty items, video games, and a Kindle store to be strange catalog fare.

The Sears and Montgomery Ward catalogs offer views of a bygone era. They were incredible in the scope of their contents. Further, facsimile editions splendidly accompany the reading of Laura Ingalls Wilder's Little House series and Newbery Medal novels such as Patricia MacLachlan's *Sarah, Plain and Tall* (HarperCollins, 2004) with their late 19th-century settings.

E. Paul Torrance Creative Catalog Elements

The magnificent and lasting work of E. Paul Torrance involves his use of two of the primary elements of creative productive thinking, **brainstorming** and the ideational techniques of **fluency, flexibility, originality,** and **elaboration.**

The provenance of these creative thinking benchmarks is not easily identified. The invention of brainstorming is most often attributed to Alex Osborn (1963). In his classic book, *Applied Imagination,* Osborn notes four guidelines that creative thinkers should activate when seeking new ideas.

1. Criticism is ruled out.
2. Wild ideas are welcome.
3. Many ideas are sought.
4. Combinations and improvements should be embraced.

Although Osborn is noted as the originator of brainstorming, it is E. Paul Torrance who greatly popularized the technique. Further, Osborn worked chiefly in the business world (advertising) and it was Torrance who realized that brainstorming could play an equally valuable role in educational settings. He greatly popularized brainstorming as a vital classroom tool, especially as related to creative problem solving.

In the 1950s and 1960s, psychologist J. P. Guilford (1967) emphasized the value of divergent thinking in such different fields as industry, science, the arts, and education. Guilford introduced or proposed four mental processes that are the key elements of divergent thinking.

Fluency is the ability to generate a great number of ideas.
Flexibility is the ability to suggest a variety of different solutions to a problem.
Originality is the ability to produce new, original ideas.
Elaboration is the ability to organize varied ideas into one or more complete products or solutions.

Torrance (1980) introduced and promoted meaningful ways for widespread understanding and use of fluency, flexibility, originality, and elaboration (FFOE) in at least two vital ways. First, he created the Torrance Tests of Creative Thinking (TTCT) which allowed FFOE to be both quantified and tested. Second, he saw the enormous value FFOE could have if teachers moved beyond the theoretical or philosophical sphere of divergent thinking and used FFOE tools in their classrooms to help students become better creative, productive thinkers and problem solvers.

FFOE in creative productive thinking tools of brainstorming and divergent thinking can be central to students as they individually and/or collectively ideate, plan, and produce creative catalogs.

Students of all ages can brainstorm the subject matter that will become the focus of original catalogs. Potential topics and themes for catalogs can include everything from endangered species to the American Revolution to ethnic holidays. As students work through the stages of brainstorming, teachers may need to remind them to adhere to all its components. Prompt students, for example, not to "kill" ANY original contributions or suggestions. It is far easier to tame a "wild" idea than it is to resuscitate a "dead" one.

The four components of divergent thinking, FFOE, will help students plan and execute creative catalogs. During brainstorming sessions, students may have decided to work individually or collectively (one or more teams). Once they choose creative catalog topics, students can use fluency to determine the subject matter of their catalogs. An "NFL" group may choose 10 or 15 past and present quarterbacks they plan to feature in their sports-oriented catalog. Similarly, students who have joined together to create a catalog of the greatest inventors of all time will use fluent thinking to choose the 10 inventors and their inventions for their final product. Flexibility may occur when students work together to decide which of the many different pathways they are going to choose in order to best (and perhaps uniformly) make their catalog entries fit into a common framework.

Originality surfaces when students decide to add special features to their catalogs. Perhaps a group has decided to create a catalog about one or more famous facts about the presidents and first ladies in the history of the United States. Could a drawing and a description lead readers to a provocative question about the catalog subjects? The bulk of the catalog will be the primary format of the catalog, but each page or entry will end with a challenging Jeopardy-like question with answers that can only be found on a related classroom "treasure hunt."

Elaboration may involve appointing a catalog editor who ensures that the whole is greater than the sum of its parts. Are all writers using a similar copy format and are all illustrators using the same media and design style? A creative catalog may be about ancient Egypt, favorite pets, the Olympics, civil rights heroes, Hawaii, Laura Ingalls Wilder's books, Disney movies, or a host of other subjects, but it should follow a uniform format. Students may want to revisit many of the classroom catalog samples to verify that winning entries follow a general format.

Creative Student Catalogs

Expect final products that are remarkably novel. One of the author's third-grade students created a catalog entitled *Robots Galore* that featured a wide range of automatons designed to cook meals, wash windows, make music, answer telephones, pick up children's bedrooms, and even do homework! A fifth-grade creative student's catalog, *Dream Homes,* was modeled on free real estate catalogs often found at the entranceway and exits of grocery stores. The amazing contents of Michelle's *Dream Homes* catalog featured detailed drawings of unique homes that might be found around the world. Highlights included a Chinese houseboat, cliff dwellings at Mesa Verde National Park, an Alaskan igloo, and a Bavarian castle. Michelle's imaginary real estate catalog even contained the ubiquitous perforated coupon catalog readers could use to receive future editions of *Dream Homes.*

Students' topics and themes can range far and wide. Young bibliophiles created catalogs that showcased their favorite authors and illustrators. One of Jan Brett's biggest fans designed and executed a tribute to the literary heroine. The Jan Brett's Best catalog featured much Scandinavian scenery and multiple examples of the author-illustrator's signature and colorful page borders. Hedge profiled Brett's career and noted many of her most famous picture book stories. *The Mitten: A Ukrainian Folktale* received special treatment as the story's human characters, Baba and Nicki, recalled the mole, snowshoe rabbit, hedgehog, owl, badger, fox, great bear, and meadow mouse who all sought warmth in the hilariously over-crowded winter hand garment.

Older students can note and highlight literary elements—characters, plot, theme, and setting—found in fiction in their catalog treatments of recent Newbery Medal and Honor books such as Kwame Alexander's *Crossover* (Houghton Mifflin Harcourt, 2014) and Kate DiCamillo's *Flora and Ulysses: The Illuminated Adventures* (Candlewick Press, 2013). One of the most highly decorated juvenile books of the recent publishing season is *The Right Word: Roget and His Thesaurus* (Eerdmans Books, 2014). Challenge gifted readers to write and illustrate seven to ten incidents from Roget's life that can serve as *The Right Word* Companion Catalog.

Theme catalogs may also be extensions of class readings, topics, and projects. Students reading Shakespeare's *Romeo and Juliet* can create classroom catalogs that might have helped either Elizabethans or Verona citizens complete their shopping. Students in social studies classrooms can fashion frontier-oriented catalogs featuring the essentials that travelers on the Oregon Trail would have needed to survive and thrive. Science students learning about weather can design catalogs that highlight tools needed by meteorologists.

There is virtually no subject or topic that cannot enable students of all ages to create original and stimulating catalogs. Two examples are noted here. *What's Your Favorite Animal?* (Henry Holt, 2014) is an animal anthology fashioned by Eric Carle and 13 colleagues, who contribute word and visual images of their most favorite animals. In this vibrantly colorful and imaginative catalog, children's literature greats such as Susan Jeffers, Peter Sis, Mo Willems, and Rosemary Wells combine catalog entries that celebrate with remarkable visual and verbal creativity the animals they prefer. Lane Smith extols the virtues of elephants, Eric Carle salutes cats, and Jon Klassen explains why he enjoys watching ducks.

In a mature, adult work of nonfiction, *A History of the World in 100 Objects* (Viking Penguin, 2011), Neil MacGregor, the director of the British Museum, catalogs 100 objects from an ancient hand axe to a contemporary credit card that tell the story of human history across thousands of years. Each entry in MacGregor's 100-object "catalog" features a photograph plus an erudite essay that includes the author's rationale for highlighting these particular objects given the museum's ownership of eight million individual items. Neil MacGregor's 100 oral commentaries or BBC live broadcasts may be found on the Internet via Google-type searches.

Students in a world history or humanities course can develop a similar "catalog" that doubles as a history of civilization. Students with an interest in architecture can study the seven wonders of the ancient world such as The Great Pyramid and then work together to produce a book that catalogs their choices for the buildings and structures that students in the distant future might feature as wonders of the world today such as the Sydney Opera House in Australia. Other phenomena that can be "catalogued" in similar fashion may include the following: the 10 greatest ideas of all time (e.g., non-violent peace demonstrations); the 20 most valuable inventions of all time (e.g., the airplane); the 15 greatest historical events in American history (e.g., the Boston Tea Party); 25 of the world's natural wonders to see in a lifetime (e.g., the Taj Mahal). The list of topics is limited only by the imagination of students and their mentors.

Putting It Altogether: An E. Paul Torrance-Inspired Creative Catalog

Charron was in the third grade when she created her particularly unique creative catalog. Charron is twice-exceptional. Her creative catalog described here highlights her gifts and talents in the diverse fields of music, sports, the arts, and mathematics. However, Charron struggled with reading, writing, and especially with timed tests. Her exceptional creative catalog nevertheless demonstrates the wide-spread gifts Charron possessed even in a third-grade classroom.

Charron's TAG teacher realized that brainstorming often works best when the number of participants is kept to a range of four to five students. In smaller groups, all participants have more opportunities to contribute and shy students are more forthcoming. Thus, Charron was in one of five or six separate groups of four students. The first two tasks for all members of each individual brainstorming group was to

generate possible topics or subjects for creative catalogs, plus make decisions about the preferred working mode of all students. Did they want to create catalogs individually, in teams of two, or in larger groups?

Charron's team brainstormed several potential creative catalog possibilities:

- Favorite games (e.g., Monopoly)
- Favorite pets (e.g., goldfish)
- Super heroes (e.g., Superman)
- Favorite comic strip or comic book heroes (e.g., Garfield)
- Favorite holidays (e.g., Thanksgiving)
- Favorite sports (e.g., soccer)
- Personal hobbies and interests
- Dynamic dinosaurs

Charron chose to fashion a catalog that would celebrate her personal favorites. Given the nature of her topic of choice, it was pretty clear that she would work independently.

Charron utilized **fluency** to generate ideas from 10 of her individual talent pursuits. Her best talents included being an artist, a figure skater, a math whiz, a photographer, an equestrienne, and a pianist.

Flexibility played a role in Charron's planning and decision making when she decided to "push the envelope" somewhat. Her creative catalog would not be a typical catalog that would fit well inside the family mailbox. Rather, she would create a BIG BOOK catalog such as the over-sized books her classroom teacher used for read-aloud sessions. Moreover, her BIG BOOK-style creative catalog would, in reality, be a very large or oversized paper doll kit.

The **flexibility** choice Charron made illustrates the fragility of creative thinking and problem solving. With highly positive intentions, the author encouraged his students to create original alphabet books about themselves. What he failed to realize was that the very use of the word "book" greatly limited the genuine creative thinking of his students. He needed to encourage students to "think outside the box." Once the word "book" was considered as just one of countless ways to make use of the ABCs, students' creativity soared. Juan created 26 "fortune cookies." Ally created a CLUE-like board game with 26 alphabetized clue cards about her life. Elizabeth, who shared Charron's love of horses, created a jigsaw puzzle with 26 pieces that were equestrienne in nature. Charron's choice of a paper doll Big Book catalog demonstrated she was not constrained by images of more traditional catalogs.

Originality was employed as Charron designed the LARGE cover (a self-portrait) and placed virtually all of her copy in a unique table of contents. Because her extra-LARGE-size individual catalog pages were mostly wordless (see **Elaboration**) images of Charron in the various costumes connected with her talents, she used her table of contents to uniformly describe her successes plus what she liked best about each of her talent areas. To further the verbal-visual nature of Charron's catalog, she used symbols of her hobbies in the colorful borders of her table of contents. These icons included her own original drawings or paintings of ice skates, a palette and paint brush, mathematical symbols, a soccer ball, a camera, and a horseback saddle.

Charron used much **elaboration** as she created the palette of vibrant primary and secondary colors used to make her catalog of paper doll costumes uniform. Throughout, Charron used the same medium of poster paint. She chose realism as the style for her paintings and again used this identical approach for every catalog page (or costume). A final page, in keeping with the same format, featured a timeline that noted when Charron would achieve her greatest successes in each of her talent and interest areas.

Automobile Catalogs in the Classroom?

It is a safe bet that the vast majority of gifted students will spend their adult lives engaged in technical writing as opposed to winning Pulitzer Prizes for fiction or poetry. Critics who wonder what today's youth can learn about developing technical writing skills and an advanced vocabulary in commercial catalogs may well want to spend a modest amount of time reading a current automobile catalog.

Weekly spelling tests in this author's classrooms consisted of four-part answers: the correct spelling of a dozen "new" words each week; the part of speech of each word as used in the example; a complete one-sentence definition of each word; and finally, 12 brand new sentences in which the students used each of the dozen weekly word choices.

Students who disliked standard or conventional vocabulary terms were highly motivated to succeed on spelling tests when the words and phrases came from well-crafted automobile catalogs. The terms were often difficult, plus the accompanying technical writing passages were first-rate examples of specialized writing. The author witnessed grade-level "D" spellers climb to the heights of "A" spelling grades when the words they found in automotive catalogs were sampled.

The following vocabulary represents one optional list of the words and phrases found in automotive catalogs.

odometer	*enduring sculpted lines*	*navigation systems*	*ventilation*	*sensors*
drivetrain	*suspension*	*lithium-ion*	*emissions*	*vectoring*
agility control	*multilink suspension*	*aluminum*	*biturbo*	*wind tunnel*
fiber optics	*independent suspension*	*impeccable craftsmanship*	*catalytic converter*	*innovative*
cargo capacity	*cylinders*	*transmission*	*chamfered corners*	*synthetic oil*
oxygenated, ethanol, and methanol fuels		*A-pillars*	*torque*	

Conclusion

Regardless of the subject matter, from automobile features to garden plants to trips around the world, commercial catalogs present students with examples of superb technical writing, exceptional photography, and other visual highlights, subject matter organization, and adult or professional level creativity. Students can create their own innovative and highly imaginative catalogs that will bring back into today's classrooms and school libraries a wide array of 2016 "Wish Books" to be savored and enjoyed. A final note. Encourage creative young catalog entrepreneurs to enter their final products in the 2016 International Torrance Legacy Creativity Awards competition.

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A Place of Their Own: The Role of Makerspaces and STEAM Labs in Developing the Talents of Creative Students

by Barbara A. Kerr & Nicole M. Farmer

Creative adolescents often have dual interests in arts and science/technology, and may have strong potential for becoming innovators in crossover occupations in STEAM (Science, Technology, Engineering, Arts, and Math). Profiling that takes into account the characteristics of adult innovators when they were adolescents may be the best way of finding students who can benefit from career development in STEAM fields. The STEAM movement and the Maker Movement provide unique opportunities for students with creative personalities, dual interests, and spatial-visual ability to try out new methods and materials, learn paths to invention, and find mentors and models.

The Need for Innovators

Innovation is the key to societal progress, but creativity has been left behind in today's schools. Although there have been many calls for increased attention to creativity in the schools in the popular media, few schools have as their primary focus the nurturing of creativity. In November 2007, The Conference Board and Americans for the Arts, in collaboration with the American Association of School Administrators, surveyed public school superintendents and American business executives to compare their views on creativity (National Conference Board, 2007). Overwhelmingly, both the superintendents and employers agreed that creativity is increasingly important in U.S. workplaces; yet, there is a gap between understanding this truth and putting it into meaningful practice. Among the key findings of this research was the fact that 85 percent of employers concerned with hiring creative people say they can't find the applicants they seek.

In addition, many creative people often turn away from creative careers, particularly in Science, Technology, Engineering, and Mathematics (STEM). Although few longitudinal studies of exceptionally creative students exist, 40-year follow-ups have shown that many creative individuals chose against public achievement in academic and STEM fields and in favor of personal achievement in arts, design, writing, and social services. A report from the President's Council of Advisors on Science and Technology (2012) found that nearly half of science oriented students, even the most creative, were not pursuing STEM degrees to completion – and it is very likely that many future innovators prematurely leave STEM majors.

If this is the case, where can we turn to fill our need for future STEM innovators? Creative secondary students are an untapped population of potential STEM innovators. Creative students who in adolescence have dual artistic and scientific interests and who excel in spatial-visual abilities may be prime candidates for recruitment into STEM fields. New methods of creativity assessment make it possible to identify these students practically and efficiently.

Finding Future Innovators

Most identification practices for creative students have as their goal the selection of students for a gifted education program. These are focused on cognitive abilities, as measured by instruments such as the Torrance Tests of Creative Thinking (1998) or creative cognition, such as the Runco Ideational Behavior Scale (2000-2001). There is a disconnect, however, between these identification practices and career guidance. It is difficult for counselors to identify those students with potential for success in creative fields for the specialized career counseling they need because they often do not have access to cognitive measures, portfolios, or competition results.

In STEM fields, there has been much emphasis on widening the pool of potential scientists by attracting women, minorities, and people who otherwise might not have considered options in science. Few efforts have been made to identify those students who are likely to be creative in STEM fields—a characteristic that cuts across race, class, and gender (Domino & Domino, 2006). It is particularly important for counselors to find and guide those people who are most likely to be scientific innovators into appropriate educational and career paths.

Predicting Adult Innovation

Adult creative productivity in a wide variety of studies is predicted by a complex combination of personality factors, cognitive abilities, relevant domain expertise, motivation, and sociological and contextual influences.

Personality Factors

Some personality traits seem characteristic of creative people across domains (Runco, 1999). These traits include broad interests, independence of judgment, autonomy, and openness to experience. Openness to experience is consistently correlated with measures of creativity. Openness to Experience, the most common personality trait among creative individuals, is defined as curiosity, a preference for novelty, enjoyment of aesthetic experiences, needs for sentience and understanding, and a higher than average capacity for absorption (Costa & McCrae, 1992).

In a meta-analysis that explored personality traits in scientific and artistic creativity, Feist (1998) linked personality findings to the Big Five personality factors: Neuroticism, Extroversion, Openness to Experience, Agreeability, and Conscientiousness. Feist found that across both artistic and scientific domains, creative individuals were characterized by high openness to new experiences, low agreeability (nonconforming), and low conscientiousness.

In a study by Batey, Chamorro-Premuzik, and Furnham (2010), facets of the Big Five Personality Factors—in particular, three of Openness to Experience (Aesthetics, Actions, and Ideas), two of Neuroticism (Angry Hostility and negative Vulnerability), and two of Conscientiousness (Competence and negative Deliberation)—provide a nuanced profile of the personality of creative individuals.

Csikzentmihalyi (1996), in his study of 100 eminently creative individuals, found similar core characteristics in the creative people he interviewed. He added to the above list of core characteristics the ability to reconcile opposites and most important, the ability to experience flow consciousness. Flow consciousness, which has been studied in depth mainly in the areas of sports psychology and the performing arts, has been found to be a state of mind claimed by creative, high performers—an optimal state of consciousness, where the person is fully immersed in what he or she is doing. The creative individual experiences great absorption, engagement, and challenge—and all other needs and sensory input are ignored. Capacity for absorption (Manmiller, Kumar, & Pekala, 2005) may be an important characteristic of creative people that leads to flow consciousness. Whether flow consciousness is a personality trait, attentional characteristic, or ability is unknown.

Creativity is often assessed without regard to the domain of work. Ivcevic and Mayer (2006) addressed this issue by performing a hierarchical cluster analysis with a group of 40 young adults to determine if there were distinct types of creative domain clusters based on different personality traits, emotions and motivation, cognition, social expression, and self-regulation. Their analysis yielded four profiles of creative traits and behaviors that discriminated between the conventional person, the everyday creative person, the artist, and the scholar. People they labeled as creative were characterized by openness to experience, creative role (such as artist or writer), persistence, trait hypomania (the ability to work with intense energy in a specific area of study for long periods of time), and intellectual curiosity. A scholar cluster of traits also emerged which included risk-taking, divergent thinking, and intrinsic motivation. Ivsevic and Mayer suggested that "results related to both specificity and generality point to the need to better understand different kinds of creativity. Since most creativity appears to be rather domain specific, it is useful to assess creativity in specific domains and make conclusions limited to those domains" (p.80).

Highly creative adolescents often have equally strong vocational interests in Investigative and Artistic careers. In addition, artists and scientists have in common high scores in Openness to Experience on Big Five personality tests. This combination of vocational interests and personality was the most common profile found in cluster analyses and principal components analyses in two cohorts of creative students (n = 485) at the Counseling Laboratory for the Exploration of Optimal States (Kerr & McKay, 2013); preliminary analyses with 190 new participants added indicate the same trend. Artistic people do not usually conform to conventions, are original, and need low cognitive structure to create, while investigative individuals prefer theories and ideas, enjoy thinking, and conduct thorough analyses (Holland, 1996). These students, who may feel that they are forced to choose between their artistic and scientific interests, may be the students most likely to become innovators who can integrate arts and technology in the emerging careers in synthetic fields such as videogame development, lifestyle apps, solar and light design, and home robotics.

Cognitive Factors

Creative thinking. Since J.P. Guilford's explorations of intelligence, creative thinking (often called divergent thinking) has been considered an ability at least partially independent of intelligence; that is, a wide variety of studies over a century have found an overlap between intelligence and divergent thinking. Creative adults appear to be above average in intelligence and have the ability to generate new ideas more rapidly and expansively than average individuals (Kim 2008).

The Torrance Tests of Creative Thinking (TTCT) (1998) are the most widely used and cited measure of creativity in the educational and psychological literature. Extending Guilford's conceptualization of fluid intelligence, the tests are intended to measure different facets of creative thinking. The sections—Thinking Creatively with Pictures and Thinking Creatively with Words—are useful for grades kindergarten through graduate school to assess four creative abilities: fluency, flexibility, originality, and elaboration. The nonverbal forms are three sets of activities: drawing lines to elaborate on a single shape, drawing lines to complete a picture, and drawing as many different pictures as possible using the same shape. The verbal forms consist of six exercises within the following activities: generating questions, describing alternative uses, and making guesses. The original tests had verbal and nonverbal forms and were scored for fluency, flexibility, originality, and elaboration. The current TTCT retains fluency, originality, and elaboration and adds Abstractness of Titles, and Resistance to Premature Closure.

In initial follow-ups, Torrance (1988) found that the TTCT scales of Fluency, Flexibility, and Originality were better predictors of creative achievements seven years after high school than intelligence or school achievement. Cramond, Matthews-Morgan, Bandalos, and Zuo (2005) reported on the 40-year follow-up of the students identified by the TTCT. Runco, Miller, Acar and Cramond (2010) found that the TTCT predicted personal, but not public achievement in a 50-year follow-up of children identified as creative.

Although the TTCT remains the most widely used instrument for assessing creativity in children, it requires advanced training to score and to interpret the results. As a result, it is used less often in research with creative adults, while shorter tests of constructs such as divergent thinking and remote associates are preferred.

However it is measured, it appears that divergent thinking remains a cognitive ability that is important in understanding differences between makers/innovators and those less likely to innovate.

Spatial visual ability. In a 20-year follow-up study of intellectually talented adolescents, Shea, Lubinski, and Benbow (2001) found that stronger spatial ability relative to verbal ability was found to predict careers in engineering and computer science-mathematics fields, whereas those with the inverse ability pattern predicted humanities, social science, organic science, medical arts, and legal fields. Lubinski (2010) made a compelling argument for the importance of spatial ability as a predictor of STEM careers, calling it a "sleeping giant" (p.344).

How then might spatially gifted students be identified? If students already identified by the SAT (or the American College Test [ACT]) and then evaluated for possible academic intervention (i.e., appropriate developmental placement) were routinely assessed on spatial ability, then some spatially talented students who score below selection criteria could still be discovered. Shea, Lubinsky, and Benbow say, "An approach likely to achieve success is for educators and counselors to become more aware of nontest signs of spatial giftedness: patterns of grades favoring science classes and labs, math classes, and vocational courses; levels of achievement and interests in hobbies requiring building, repairing, or creating; interests in 'things' (rather than 'people' or 'ideas') and in tinkering with objects, and preference for reading science fiction over nonfiction …Such activities are signs of exceptional nonverbal abilities" (p. 612). In addition, the authors suggest that students high in spatial ability should be encouraged to explore career options in fields with more hands-on activities such as architecture, engineering, physical sciences, technical disciplines, and creative arts.

It is likely, however, that personality characteristics interact with cognitive abilities, subtly modifying the potential course of individuals' trajectory into the world of work. People do not simply gravitate toward creative or noncreative careers; they lean toward a particular career path because it seems to fulfill a complex combination of talents, needs, interests, activity level, and values. By adolescence, these characteristics may have been shaped by education and socialization into specific clusters or profiles that can be matched with career development pathways.

Assessments that focus on only one aspect of creativity such as creative thinking (Torrance, 1984), creative personality (Feist, 1998), or creative people's interactions with the environment (Amabile, 1996) are less likely to predict career development pathways than the more holistic and comprehensive ones. For the purposes of career development, unitary assessments of creativity leave much to be desired. Some are too narrow in focus; some are very difficult to administer and score; and some are very expensive.

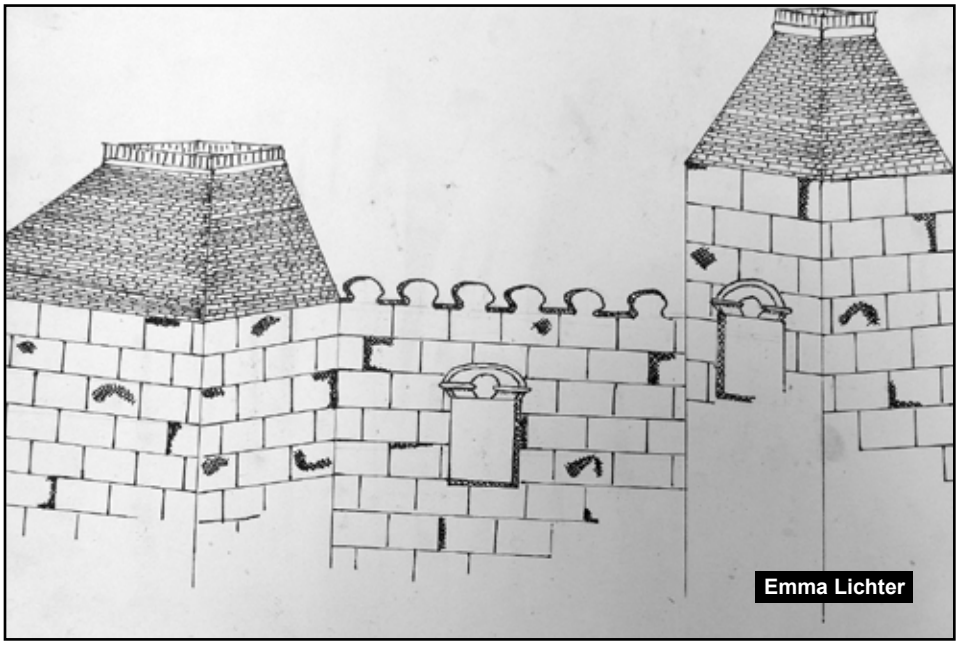
Profiling creative adolescents. An efficient method of identifying young people with potential for creative careers in STEM might be a profiling approach. In Kerr and Kurpius' (2005) 10-year study of math/science talented girls, a profiling technique was developed that incorporated achievement scores and grades into personality profiles that reflected the characteristics of accomplished women scientists. These vocational interests and personalities of the profiled group matched those of the criterion group of scientists. It is possible, therefore, that a profiling method may be an effective way to identify

creative young men and women who can profit from specialized career counseling interventions. Kerr and McKay (2013) analyzed the biographies and existing empirical data on eminent individuals to develop profiles of the biographical, interest, personality, values, and typical accomplishments of eminent people at 16 years of age. The resulting profiles were then distributed to teachers in 28 Midwestern high schools so that 500 students fitting the profiles could be identified for structured interviews and guidance services. Findings of the seven-year study of profiling yielded the following information.

Teachers could accurately identify students through profiling that would score similarly to experts in four creative domains in interests, personality, and values.

Profiled students had equally strong interests in artistic and scientific/technological careers, scored highest in openness to experiences, and were more accomplished than average students in their domains of expertise in music, arts, technology, writing, performance, social entrepreneurship, and scientific research.

Both factor analyses and hierarchical cluster analyses revealed that creative students clustered into four patterns: The Creative Scholar, verbally and mathematically gifted, who was equally creative and interested in science and arts; the Inventor/Innovator, spatial-visually gifted, who combined artistic and technology interests; the verbally gifted Social Entrepreneur, who was equally interested in social and creative activities; and the verbally gifted Emotionally Creative, who was equally interested in teaching/healing arts and creative activities. Clearly, the unusual combinations of interests and abilities in these students made for complex academic and career guidance. Not only were these students likely to want to learn several knowledge domains and the accompanying methods and tools of those disciplines; they were also likely to integrate their studies and training. For creative adolescents, the need to identify careers that allow for multiple, integrated disciplines is strong. Even more pressing may be the opportunity to try out integrative creative activities with mentors and role-models to guide them.



Career Development Needs

For creative secondary students, the difficulty of discovering the education and experiences necessary for these careers is equivalent to invisible ladders, where they know the destination, but cannot find the way there.

Creative adolescents need career guidance that helps them understand the wide variety of occupations open to students with combined arts and science/technology background. In addition, they need models of people currently engaged in creative occupations. Spatially/visually talented young people need and want opportunities to try out the methods, materials, and machines that allow innovation. Even though pathways to these interdisciplinary careers vary, particular kinds of training and work experiences are more likely to lead to success in finding creative work. Two of the most promising educational and career pathways for engaging creative students are the STEAM movement (Science, Technology, Engineering, Arts, and Mathematics) and the Maker movement.

The STEAM Movement

The STEAM movement is very young in terms of both societal and scholarly discourse. Siefter (2012), a corporate leader, was one of the first to call upon science educators to integrate the arts into the teaching and practice of science as a means of increasing innovation. Three NSF sponsored symposia brought together leaders in the arts, design, and STEM to discuss the way forward. The goal, said Maeda (2013), is to foster the innovation that comes from combining the mind of a scientist or technologist with that of an artist or designer. STEAM projects were established in a few schools and discussed in several teacher training workshops. "STEAM labs" began to appear in schools of engineering such as Arizona State University and Purdue University, where artists, designers, scientists, and engineers could collaborate. Product design, visual technologies, architectural

engineering, and videogame design are only a few of the fields that integrate arts and STEM. The emphasis of STEAM labs is the integration of the arts into STEM fields in order to broaden participation of diverse groups in science as well as to expand the creativity of scientific fields (Thompson, 2014).

The Maker Movement

The Maker movement has many similarities to the STEAM movement, in that most Makerspaces encourage combinations of arts and technology and encourage creative problem-solving through hands-on problem-solving and creation. They differ in their origins in that the STEAM movement began with academic leaders seeking interdisciplinary, innovative approaches to science and technology education and the Maker movement is a grassroots movement stemming from community-based workshops and hacklabs. Both of these movements are important in providing new concepts and methods for working with creative adolescents.

History of the Maker Movement. The Maker movement has taken do-it-yourself production and rejuvenated it online, bringing together communities of innovators (Anderson, 2012). Inspired by the hobbyist of the mid-1900s and magazines like *Popular Science, Popular Mechanics, and Popular Photography, Make* magazine was created in 2005 to rekindle the spirit of doing and creating (Dougherty Interview). The Maker movement combines open-source learning, computer-aided design, and 3-D printers, with community workshops. Dale Dougherty, founder of *Make* magazine and the Maker Faire, describes the tinkering that occurs from the Maker movement as "innovation in the wild" (Dougherty, 2012).

Who are makers? Makers, participants of the Maker movement, are curious individuals with the motivation to create. They have interests in art, craft, engineering, music, food, science, technology, and health, often blurring the lines between disciplines (Maker Playbook). Makers, however, are not defined by educational level, income, age, ethnicity, or gender. Makers are the popular magazine hobbyists of our time; they are tinkerers, creators, and entrepreneurs. Makers are both teachers and learners and participate in the sharing of rare learning. Makers obsess over the improvement of "things" and ask, "What can I do with what I know?" (Maker Playbook). Makers are creative. They find new solutions to old problems, infusing passion into an abandoned puzzle. As an important part of the process, Makers will fail in their creations but will utilize this experience to create something better.

Over and over again, the Maker movement emphasizes the need for members to participate with goods beyond that of being a consumer. As Dougherty says, most people won't claim to be an inventor, but are happy to claim the label, Maker. Currently, approximately 135 million U.S. adults participate as makers; this represents 57% of the U.S. populations over 18. Notably, these Makers have contributed $29 billion annually to the economy (Owyang, 2014) and are contributing to changing the face of industry.

Beyond contributing to the economy, Makers are meaning making. In the current economy, many people find themselves working in jobs where they never see the results of their work or participate in activities that they consider meaningful. Making allows people to shape materials and data in their own ways, becoming personal manufacturers. In addition, they have the pleasure of having the end product. Finally, making not only allows for personal creativity, but opens up the possibility for shared, collaborative creativity within a supportive community.

Where are makers (description of typical makerspaces)? The Maker movement is profoundly democratic in its community. Makerspaces tend to be public, open to all ideas and methods, and tolerant of a wide diversity of people. Most makers have in common the desire to create and solve problems, even when the problems are not overtly apparent. Makerspaces provide physical environments in local communities for Makers to freely cultivate creations emerging from their passions.

Makerspaces are committed to open source software, hardware, and organizational structures. Like the early Silicon Valley organizations, they tend to be lateral rather than hierarchical in structure, and tend to be decentralized rather than centralized in power. This value of freedom shines through with gym-like memberships leaving most makerspaces available for use 24 hours a day, welcoming their members with the question, "What do you want to make today?" Because Makerspaces are open at any time, there is no waiting for someone else. You set your schedule; you decide what to make and at what rate of progress; and you seek evaluation in your own way. You choose your audience and your own feedback. You are free to fail or succeed without repercussion or shame. Self-sufficiency is a goal, from making your own stuff to making your own job.

The contents of a makerspace do not define its space but the activity it inspires and supports (Makerspace Playbook). The space fits the unique needs of the community through organization, supplies, and offerings. Makerspaces can be found in old warehouses, basements, schools, and libraries. Often, makerspaces will house equipment not commonly available to the single household. This equipment may include 3-D printers, laser cutters, an array of power tools, sewing machines, portable power sources, metalworking tools, and sculpture material, and an assortment of odds and ends together in a creative playground. A makerspace will also host workshops ranging from the introduction of a new skill to the mastery of a longtime hobby from the shared expertise of another member (Peppler, & Bender, 2013).

How can the Maker movement help develop creative students? Finding its ancestry in home economics, shop class, sculpture, and the chemistry lab, the Maker movement is returning hands-on learning back to the education system, calling for students to engage in development through design (Anderson, 2012). We have the opportunity to ask students not only what the object, program, or creation does but how they can make it better, or use it in a new way, in essence, expand on the functionality through creativity. Kalil (2010) describes the maker mindset as "empowering people not just to seek out jobs in STEM or creative fields, but to make their own jobs and industries, depending on their interests and the emerging needs they see in rapidly changing society." The Maker movement provides "shape" for reaching careers once left uncharted by the invisible ladder. The Maker movement promotes bottom-up decision making where students are free to explore their passions and create (Peppler, & Bender, 2013).

The Maker movement is inclusive and feasible for the growth of creative students. One library found the cost of maker equipment to be easily justifiable. Trading out certain journal subscriptions that cost more than $3,000 per year, the $25,000 cost for two 3-D printers seemed feasible (a history of making). Now, a 3-D printer can be purchased for as little as $500. Nevertheless, the creation of a makerspace is not the only way to engage students in this movement. Approximately 2,000 makerspaces have cropped up around the globe (Tierney, 2015), with Maker Fairs and Mini-Maker Fairs occurring annually. Through these events, creative students can be connected to mentorship, new skills, and the endless combination of interests.

The Maker movement aspires to transform education. As a partner in innovation and creativity, the Maker movement sees itself as an agent of inspiration by inviting students to participate in the creative economy and direct their own future (Makerspace Playbook). The STEAM and Maker movements not only recognize and value innovators, but also make invisible pathways to these careers visible.

Most important, perhaps, is that Makerspaces and STEAM labs provide students who have never quite fit into the ordinary classroom a place of their own. Students with dual interests in arts and sciences and with strong spatial-visual abilities will feel at home in a place where they can invent and design their own products. Creative students who find the conformity, structure, and routine of the regular classroom frustrating may be able to thrive in the open, low-structure, and collaborative environment of the Makerspace. All students who love to problem-solve using both their mind and hands will be released from boredom. Finally, in these environments, creative students often feel motivated to learn the mathematics, verbal skills, and social skills they may have neglected before in order to produce and promote their products.

Math is perceived by many artistically creative students as a deal breaker. STEAM programs that are serious about attracting spatially-visually talented students will need to find new ways of teaching math through art and spatial-visual problem-solving. In addition, most creative students have high scores on sentience and aesthetic values, particularly art students. STEM environments are perceived as beauty-free environments by those sensitive to color, design, and lighting. These students need to be encouraged to make STEAM labs and Makerspaces more inviting for themselves and others. Artistically talented students differ from STEM students in having lower conscientiousness, less stability of mood, and lower impulse control. STEM teachers working in Makerspaces need to be prepared to work with these students by learning effective teaching strategies with creative students. Providing more freedom and self-determination while teaching students the self-regulation strategies they will need to complete projects, to present their products to others, and to collaborate with a diverse group of artists, designers, and scientists will be critical.

The possibilities for the Maker Movement and the STEAM movements to identify and provide for the career development and learning needs of creative students are many. The use of profiling methods that include interests, personality and cognitive factors, and creative accomplishments may be a promising way to identify students who will benefit from STEAM labs and Makerspaces. The growth of these spaces in the schools opens up the possibilities of a place where creative students can be comfortable and productive. Finally, there is the possibility that many more students will be recruited, guided, and mentored into the STEAM careers that are on the frontiers of design and technology.

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Drawing While Talking and Thinking: Exploring the Intersection between Creativity and Imagination

by Joy C. Phillips & Jen Katz-Buonincontro

The study of creativity has a storied past with roots that can be traced back to the early 1800s (Runco & Jaeger, 2012). Contemporary creativity scholars typically draw upon the pioneering work conducted in the 1930s, 1940s, and 1950s, particularly the work of Guilford (1950) and Torrance (1962, 1974) who "attempted to measure creativity from a psychometric standpoint…[with concentration] on divergent thinking" (Sternberg, 2006, p. 87). Runco and Jaeger (2012) argue that, based upon its long history, creativity has a *standard definition* that is composed of two criteria, originality and effectiveness. They note, however, that the presence or absence of these criteria is subject to individual or collective judgment about which much less research has been conducted.

Another prominent creativity scholar, Robert Sternberg (2006), has done extensive research from a perspective that he describes as a "confluence approach" (p. 87). From this work, he has developed an "investment theory of creativity… [in which] creative people are those who are willing and able to 'buy low and sell high' in the realm of ideas" (p. 87). Based on economic theory, Sternberg's theory suggests that creative people "invest" in new or uncommon ideas that they then "sell" to a broader audience before moving on to new ideas. In the investment theory of creativity, Sternberg suggests that creative people choose to "generate new ideas, analyze these ideas, and sell the ideas to others" (p. 90) as they make use of six interrelated resources: intellectual skills, knowledge, thinking styles, personality, motivation, and the environment.

In this article, the authors take a novel approach by exploring distinctions between creativity and imagination in a manner suggested by Thomas and Brown (2011). Using data collected in two independent research studies, the authors use an approach based on Thomas and Brown's theory to examine two related arts-based phenomena: Spontaneous drawing while (a) talking and (b) listening. Initially, the authors explored how the intentional use of drawing during qualitative data collection might provide insight and thoughtful depth not revealed using traditional data. During comparative analysis of the two independent studies, the authors made an interesting observation: The focus of one study was on problem solving while the other focused on problem framing. This distinction suggests that both studies represent innovation; however, the problem *solving* study is solution-based while the problem *framing* study is inquiry-based. This finding follows Thomas and Brown's (2011) claim that the notions of creativity and imagination "are not only distinct, but they offer very different perspectives on the problem of innovation (para.3). The authors use Thomas and Brown's theory to frame the analysis and comparison of the two independent studies of creativity and imagination as distinctive perspectives on the problem of innovation. We operationalize innovation using a definition suggested by Rogers (2003), "An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 12).

Literature Review

Within the broader field of creativity research, this article draws from three particular literature strands: (1) the arts-based methodology of self-portraiture, (2) the spontaneous drawing also known as doodling, and (3) arts-based educational research (ABER).

Self-Portraiture

In a typical self-portrait, a student draws or paints an image of his or her own face and/or body. From an instructional perspective of traditional self-portraiture, the student focuses on which design elements (color, shape, line, form) and principles of art (harmony, balance, pattern) are used in his or her self-portrait (e.g. McCutcheon, 2012). However, some self-portraits go beyond a more traditional, formalist approach and accentuate the psychological attributes, social characteristics, and cultural aspects that the student desires to communicate about him or herself (see Grushka, 2008; Sullivan, 2005; Ward, 2010). Taken together, the visual symbols depicting the physical features of the self, combined with the psycho-social-cultural aspects, constitute an aesthetic representation known as self-portraiture.

Doodling

Doodling, or spontaneous drawing, suggests specific brain involvement medical researchers call the intrinsic default network, "an anatomically defined network [which] includes the medial temporal lobe and medial prefrontal subsystems and posterior cingulate cortex" (Schott, 2011). Contemporary medical researchers cite influence by the seminal work of Maclay, Guttman, and Mayer-Gross (1938) who studied 9000 doodles submitted by the public in response to a newspaper competition. Andrade (2009) conducted an experimental test of the degree to which doodling aids concentration. Findings suggest compelling hypotheses of the mechanism that enables doodling to aid concentration including, "stabiliz[ing] arousal at an optimal level, keeping people awake…[during periods of] boredom…[and] reducing daydreaming, in situations where daydreaming might be more detrimental to performance than doodling itself" (Andrade, 2009, p. 103). Recently, an international conference entitled "Thinking through Drawing 2012: Drawing in STEAM" was held at the Wimbledon College of Art in the United Kingdom. This conference focused on how drawing was used within and between STEM (science, technology, engineering, and mathematics) topics. Four attending artists responded to the presentations and discussion by drawing extensively; these illustrations and comments were captured in the conference proceedings (Brew, Fava, & Kantrowitz, 2012).

Arts-Based Educational Research

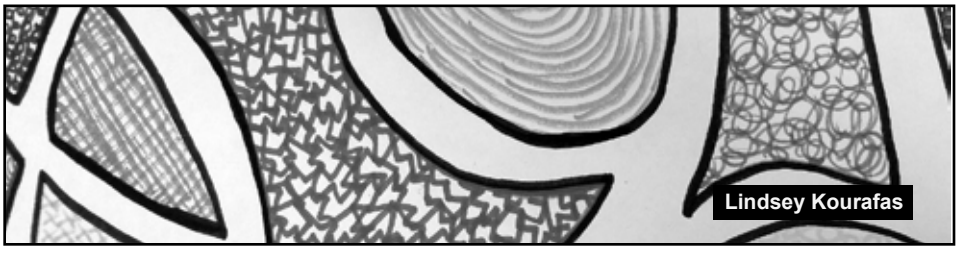
Arts-based educational research (ABER) has emerged and matured considerably over the past 15 years (Piantanida, McMahon & Garman, 2003). And yet, ABER still resides in the margins of dominant research methodologies because ABER researchers often question identity formation and social norms (Denzin, 2000; Slattery, 2003), thus giving primacy to inquiry over knowledge formation (Bochner & Ellis, 2003). The commonality among researchers using visual arts-based research methods centers is the use of the visual arts to provoke deep critical and creative thinking in students and in themselves. This kind of thinking resonates with models of critical pedagogy in PK-12 art education (Hamblen, 1988) and art as a form of expression grounded in an "aesthetic of color" and critical race theory (Denzin, 2000).

Research Design

Research Case Studies: Setting and Data Sources

Case # 1: Drawing while talking. This case originated from a mathematics-based digital learning study (Katz-Buonincontro & Foster, 2011) conducted in an urban high school classroom in a large East Coast city. The study included 12 female and 9 male students (14 to 15 years of age) who self-identified as follows: 16 African American, 1 White, 2 Latino, 1 Asian, and 1 student who self-described as "Other." While playing a mathematics-based digital game, the students noted with dislike that the digital game provided avatars with Anglicized features such as white skin and straight hair. In response, the second author sought to create a more engaging classroom setting by designing an art activity that enabled students to explore their beliefs about their identity and academic goals. For this activity, the author gave students Crayola (2011) "multicultural" markers with an "ethnic-sensitive color palette" and 18" x 24" white drawing-grade paper. Both the author and the participating students drew self-portraits as avatars with designated academic "powers" (see Figure 1).

Case # 2: Drawing while listening and thinking. This case is based on phenomenological interviews conducted with an art teacher who served as a key reform leader at a public elementary school. The school, in a large Southwestern city, was participating in the regional implementation of a major national reform initiative (Reyes & Phillips, 2002). To explore a conjecture that having an arts background influenced



one's thinking about school change, the first author focused the study on exploring how this teacher leader thought, especially when creating a piece of art. An experienced art teacher, she said she doodled all the time especially during meetings because it helped her reflect on the discussion and identify recurring patterns and emotions. During the interview, she provided a drawing (see Figure 2) she created while attending a professional development session.

Data Analysis Framework

We posit that the drawings collected in the two case studies, along with interviews and discussion field notes, provide enhanced avenues for participant and researcher meaning making. Moreover, we suggest that the data from these studies illustrate different aspects of innovation, creativity and imagination. We use a framework proposed by Thomas and Brown (2011) to explore the degree to which the studies align with one or the other aspect or intersect with both dimensions. Thomas and Brown define creativity as, "[T]he ability to use resources in new, clever, or unpredictable ways to solve a specific problem in a particular context" (para. 3). In contrast, they describe imagination as, "[A] preamble to a problem… [that] allows us to imagine different problems or different spaces to solve them" (para. 3). Table 1 highlights the distinctions Thomas and Brown make between creativity and imagination, and Table 2 provides an analysis of the two cases using this framework.

Table 1 - Two Dimensions of Innovation

INNOVATION	
Creativity	**Imagination**
Solution based	**Inquiry based—What if?**
Take familiar, make it strange	**Make the strange, familiar**
Method for solving a problem	**Build world around new idea**
Creativity alters content	**Imagination reshapes context**
Efficiency	**Experimentation, design, play**

(adapted from Thomas and Brown, 2011)

Results

Results focus on how visual imagery of drawing and doodling paired with the interview process to accentuate creativity (study 1) and imagination (study 2) of the study participants, using Thomas and Brown's (2011) five dimensions of creativity and innovation.

Study #1: Emphasizing Creativity through Drawing

The avatar drawing activity took place during a period of two weeks in fall 2010, as part of a larger study. Four aspects of Thomas and Brown's (2011) conception of creativity are used to frame how drawing was used as a form of innovation in a larger study on digital based games: a) solution based, b) taking the familiar to make it strange, c) altering content and d) the principle of efficiency.

Solution-based. The behavior dynamics of the classroom were impeding the successful implementation of the research study: Students acted out, yelled, were frequently absent and occasionally rude to each other, to students, and to the researchers. Secondly, the digital game included Anglicized representations of the game-players: Students could only create Caucasian avatars. To address both issues, the second author created the Avatar drawing project.

Taking the familiar to make it strange. Students were encouraged to accentuate the psychological attributes, social characteristics, and cultural aspects that they wanted to communicate in the avatar drawings. Students took the "familiar" Caucasian male avatars and made them "strange" to the original game—by giving them African-American skin color, hair styles, and female identities with jewelry, makeup, and feminized features such as exaggerated eyes and eyelashes. Students also took the "familiar"—in terms of traditional self-portraits—and made them "strange" by giving themselves new characteristics that would be beneficial in school and in life, such as names that represented their own unique identity e.g. "Prissy." They literally shaped how they wanted to be perceived in the digital game they were playing. Students were given large sheets of 18"x24" paper with a "shell" or outline of an avatar's upper body and head. A space for a caption/name was given near the bottom of the paper. Students were asked to describe the avatar in terms of what academic powers they wanted to give the avatar, how the avatar reflected his or her view of school and past school experiences (current school experience). Students were prompted to imbue the avatar with a special name that reflected their academic and life goals (future school experience).

Altering content. "Content" can be defined as the math-based game avatar. The avatar drawing exercise allowed students to literally *alter* this *content,* e.g., the identity of the avatar presented in the game, to represent their own individual identity. This could be interpreted as an act of creative transformation in terms of appropriating the idea of Caucasian male avatars and transforming them into African American and multi-ethnic avatars, both male and female.

Additionally, the exercise helped to change the physical context of the classroom, which was affecting the quality of the social interactions (problem #1). Forming large workspaces in the center of the classroom to facilitate drawing allowed students to interact with peers they would normally not sit next to and collaborate with (see Figure 3). In return, this helped the students

trust each other, solve behavioral problems with peers and teachers, and establish rapport with the researchers. Drawing helped students focus their attention and become acclimated to their new classroom. As ninth graders in a new high school, students were now the youngest students in the school. Drawing ultimately helped them calm their outbursts of behavior, and assisted in developing a quiet atmosphere conducive to academic learning.

Efficiency. Instead of wasting time off task, students started to express their thoughts and academic goals through drawing and discussing their avatars. Students reflected on their educational experiences and academic aspirations in ways that differed from previous conversations, which can be attributed to the act of talking while drawing their avatar self-portraits. Here, student Shakil provided comments on his avatar that revealed how he viewed himself as an emergent leader following the role model of President Barack Obama. Before the drawing activity, he engaged himself in class activities for the research project but could get distracted and shy away from discussing his thoughts:

> ***My avatar is basically like Barack Obama…I want my avatar to symbolize something like Barack Obama to help people out…I'm looking to help people or just to have fun. I want…a power that can lead. I want to help people***
> (See Figure 1 example of avatar self-portrait).

This quote shows some conflicting thoughts from Shakil. For example, he aspires to emulate the leadership qualities of President Barack Obama, yet he shows some ambivalence or lack of confidence that his reasoning is insufficient. That is, he states that he wants to "help people out" but also that he desires "just to have fun." This conflicting statement reveals how students produce a statement that seems to represent a new, deep insight but that they also want to appear likeable and cool to their peers, which is reflected in his desire to "have fun."

Students who were extremely quiet and reticent to talk to the researchers were able to open up and begin engaging in discussions. Other students who were typically loud or acted out during class discussions explored their thoughts in new ways through the avatar self-portraits. Here, student Zulema (pseudonym) discusses her past and how it affects her behavior in the classroom, while drawing:

> **Researcher:** What's the one thing your avatar could do that you can't?
>
> **Bonita:** To get people to stop saying mean stuff about me.
>
> **Zulema:** To kill people. I just want to kill people [laugh] [that talk bad about me]. See me, I have a Dark Side. I have a bad past.
>
> ***Students argue a bit and excitedly speak at the same time.***
>
> **Bonita:** She's the demon!
>
> **Zulema:** *Shut up!* That's true I am a demon. For some reason, I always have black, black, black on. …so, my Dark Side, that's everything to me that happened in the past that I need to go to a psychiatrist or therapist about.
>
> **Bonita:** Drama Queen-that's me. I'm always in drama.

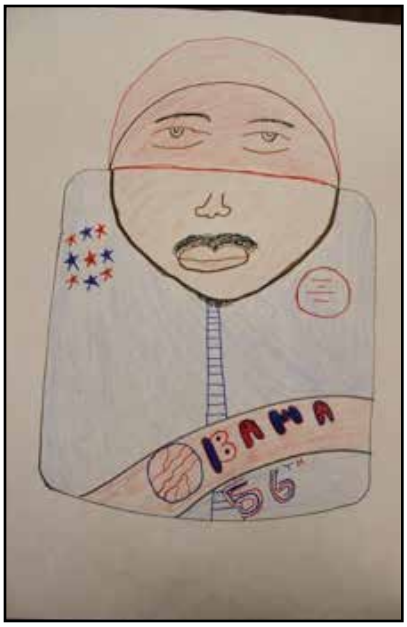


Figure 1. Obama-56 Avatar Self-Portrait

In this banter between Zulema, Bonita, and the researcher, the students admit they have some strong feelings about how other people perceive them "to get people to stop saying mean stuff about me." These feelings are not easy to admit to and to take ownership of, especially when considered a difficult student in the class as Zulema was. Zulema also admitted that she has a "Dark Side" and a "bad past," which can be shameful in a classroom setting. The discussion was a rare moment for these two students because they did not want other students to hear what they had to say. But, these moments of honesty helped them to engage in the research project, commit to wanting to participate and accept themselves for who they were. These attributes can help build a rapport that can translate into good classroom learning.

Study #2: Imagining the Possibilities through Drawing

The first author interviewed Bernadette, an art teacher who served as a school reform leader, after a major multi-school district reform initiative ended; these interviews were conducted as meaning-making research activities to explore school reform from an art teacher perspective. In this section, five

aspects of Thomas and Brown's (2011) concept of imagination are applied to the teacher leader's drawing: a) inquiry-based, b) making strange, familiar, c) building world around new idea, d) imagination reshapes context, and e) experimentation, design, and play.

Inquiry-based. Bernadette said she doodled all the time, especially during meetings because it helped her think about what was being said. For example, during a training session on the Primary Years Curriculum[1], she said she doodled while the trainers talked about the need for vertical curriculum integration. As they discussed how practitioners tend to get stuck on horizontal integration, Bernadette thought, "What we really need is diagonal integration!" As she considered how diagonal integration might look, she "doodled" an intricate drawing to help her think about "what if?"

Making the strange, familiar. When asked to interpret how her drawing related to innovative school change, Bernadette used art language that was familiar to her:

> In order to think outside the box, you can never get inside the box. Because, in order to change the way we do things in schools, all this [the action in the drawing] has to occur. In the beginning you deal plainly with the most basic thing, which for me is *line.* But then as I start to draw, I start seeing all levels of *value.*

In this description, Bernadette immediately connected school change with line, a principal element of design. Continuing this alignment, she delved deeper into other design elements.

> But, first it's very simple: What are the things we want, and what are we going to do to get there? So, I always start with the foundational structure, just pure, clean *line.* Pure, clean line is what's going to establish those shapes. But shapes aren't anything if they don't have *form.* And form comes from *value.* Then, if you keep going, you start adding *color.*

In this example, as Bernadette used her experience with art theory to describe the nature of school reform, she made the unfamiliar, abstract notion of school reform, familiar.

Building new world. Initially, Bernadette drew a box (left center); it's barely visible in the finished drawing that extends substantially beyond the box's borders. Moving in a clockwise direction, she drew a strong diagonal line (lower left) surrounded by flowing circles moving in various planes. As the circles seem to bump into lines, they appear to move around or over them. All movement is under watchful eyes that observe from the upper left corner. As the circles flow across the top of the box, they move outside to the right, nearly doubling the original size of the box. Where the circles continue toward the point at which she began, Bernadette drew what she described as gears and cogs. Bernadette's completed drawing transforms the notion of vertical and horizontal curriculum integration into a completely new image imbued with elements that denote action.

Reshaping context. For Bernadette, her knowledge of art infused her thinking process and informed how she made sense of information. Her comparison of values in art to values of people provides another illustration:

> When I talk about value, I'm also talking about beliefs, because it's simultaneous. As an art person, you look at your world in an artful way. So when I think about these systems, in order for us to change, we have to deal with the values of everybody. And values are not black and white. It's not easy; there are shades of gray. Because there are so many things that influence us.

In art, values refer to varying degrees and intensity of color. This analogy to educational systems complicates the common dichotomous view that things (e.g., educational policy, situations, children's behavior or aptitude, academic achievement) are either one way or the other.

Experimentation, design, and play. Bernadette viewed educational change as expansive, contested, and messy:

> It's the same way with a piece of artwork. In the beginning when you're building the foundation, you worry about very few things. You're just worried about getting started. So it's very clean; it's not messy. And as you keep going, in your thinking of what you're trying to reform, it becomes very messy. Then, most people go back to the clean version—what's simple and clean…because it's easier to understand. And that has nothing to do with change. That's just keeping things the same way they were before.

Figure 3. Drawing workspace: encouraging collaboration with peers and researcher (on right).

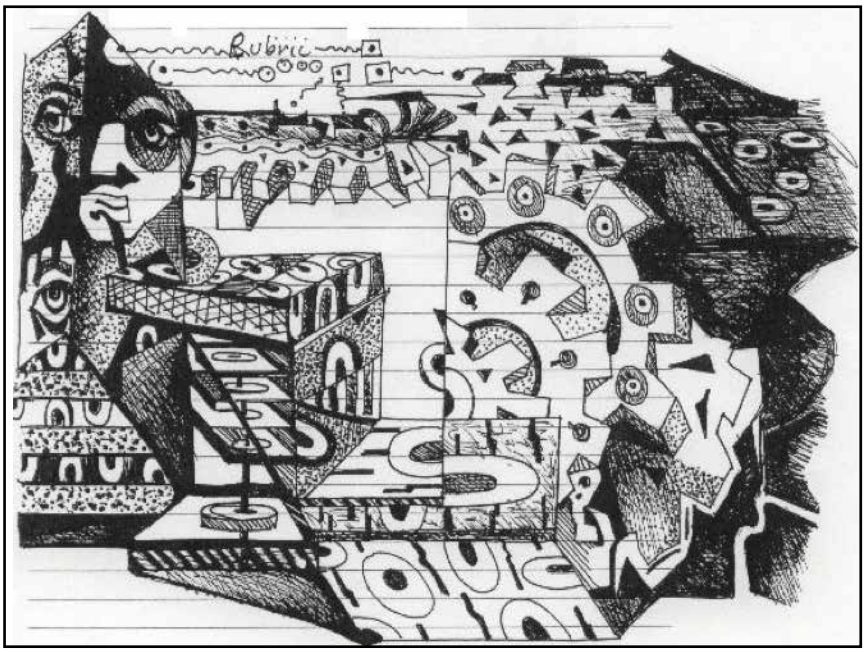


Figure 2: An Artist Thinks Outside the Box

To make sense of the messy nature of school reform, Bernadette allowed her imagination to wander as she "played" with words and ideas to consider both the depth and breadth of an authentic change process.

Discussion

Using the framework derived from Thomas and Brown's (2011) discussion of innovation, the authors experiment with aligning Case # 1 with the creativity perspective and Case # 2 with the imagination perspective. Clearly, both cases could be considered as creative *and* imaginative endeavors; however, a certain degree of difference can be discerned as shown in Table 2.

Analysis suggests that Case # 1 fits the creativity perspective described by Thomas and Brown in several distinct ways. Fundamentally, the arts-based activity of creating multi-ethnic avatars was devised as a way to engage ninth-grade students in a research study that employed a mathematics-based digital game. This problem-solving orientation provided at least two benefits. It enabled the students to draw avatars that fit their personal characteristics, and it helped the researcher focus the students on the task at hand. Furthermore, it allowed participating students to imbue the activities surrounding the study with meaning as they put themselves into the individualized avatars. Similarly, it provided the second author with important information about setting the context for the research study. By placing themselves into the avatars, the students took their personal characteristics, which were familiar to them, and fit themselves to the avatars in the unfamiliar mathematics-based digital game. Finally, by creating a more engaging classroom setting, the researcher was able to proceed with the research study in an efficient manner.

In contrast, Case # 2 illustrates an abstract endeavor that was inspired by the art teacher leader solely as a meaning-making device. Engaging her imagination, she took in professional development information, and wondered "what if?" What if diagonal integration was used to integrate instruction in schools? What might that look like? As she mulled over that idea, she used her experience and skills to create a conceptual model infused with arts-based principles (e.g., line, color, value, etc.). As this teacher interpreted her drawing, she noted that she had started with lines—horizontal, vertical, diagonal—which suggest a box (e.g., a place, a setting). However, in the finished doodle, the box is barely visible as it is subsumed within a much more complex contextual drawing. The drawing suggests that one can build a new world (e.g., learning environment, etc.) by expanding the boundaries of an idea. This case provides an illustration of how imagination can reshape context in a way that is experimental and playful.

Fundamentally, both case studies provide examples of how participants struggle to make meaning out of information by using creative and imaginative activities. Further analyses could be conducted to reverse the alignment or to search for an alternative framework that might better capture the dynamics inherent in these two studies. However, the present analysis is designed to promote discussion about how arts-based activities can be used to deepen insight and thoughtful reflection within research and educational practice. These cases also provide illustrations of how arts-based activities might be used to solve a specific, concrete problem or to provoke more abstract, conceptual inquiry. In application, both approaches could be employed in the same study at different phases of work.

Significance

In these two studies, drawing while talking and listening helped students and teachers disclose personal, subjective meaning (Barone & Eisner, 2012) that might have been "ineffable" to articulate (Weber, 2008), or time-consuming through oral and written expression. Making works of art can also be a person's preferred way of communication (Newton, 1976), thus allowing researchers to understand students' thoughts around subjects that can be difficult to discuss in the classroom, like cultural identity. Furthermore, comparative analysis of these two case studies provides contrasting illustrations: Creativity in the service of instrumental outcomes (Hamblen, 2009) and imagination as a means of promoting critical reflection (Schön, 1983). These studies contribute individually and collectively to the knowledge base on creativity and imagination.

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1. The Primary Years Programme (PYP) is a component of the International Baccalaureate Program located in Geneva, Switzerland. The PYP is targeted toward children 3-12 and focuses on developing the whole child—academically, socially, physically, emotionally, and culturally. For more information see http://www.ibo.org/ibo/index.

Table 2: Analysis of Innovation

INNOVATION			
Creativity	**Study #1**	**Imagination**	**Study #2**
Solution based	Researcher needed to engage students in mathematics-based digital learning game that included avatars with Anglicized features	Inquiry based—What if?	The art teacher responded to discussion about horizontal and vertical integration with the thought, "What we really need is diagonal integration." What would that look like?
Take familiar, make it strange	Ninth grade students created multi-ethnic personal avatars as a way to explore their beliefs about their identity and academic goals	Make the strange, familiar	Horizontal integration (at one grade level); familiar Vertical integration (across grade levels); familiar (strange) Diagonal integration = introduce art concepts of line, form, value, color [strange] as metaphor for change
Method for solving a problem	The researcher-designed arts-based activity was developed and used to engage students meaningfully in a research study.	Build world around new idea	Doodle drawing began with horizontal, vertical, and diagonal lines and expanded to imagine a comprehensive learning process.
Creativity alters content	Arts-based activity enabled the researcher to alter the original content to create a more engaging classroom setting	Imagination reshapes context	The original lines are barely visible in the finished drawing that is filled with details; the drawing can be interpreted in multiple ways by artist, researcher, viewer.
Efficiency	When the ninth graders engaged with the arts-based activity, the students' behavior improved, and the researcher was able to proceed with the research study.	Experimentation, design, play	The art teacher described her drawing as playing with ideas; she used details such as eyes, eggs, cogs, etc.

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Relevance in the Gifted Classroom- Connecting our Students to the World

by Harry T. Roman

Let us think of education as the means of developing our greatest abilities, because in each of us there is a private hope and dream which, fulfilled, can be translated into benefit for everyone and greater strength for our nation.

- John F. Kennedy

(www.quotationspage.com/quote/8280.html)

Background

Nothing makes a lesson plan last a lifetime more than relevance of classroom activities to the grown-up world. This was the magic behind the legendary Dick and Jane readers, which, though later criticized for their lack of diversity and stimulating content, enjoyed tremendous success since their publication in the 1930s through most of the next four decades. Over 80 million children learned how to read via these books, because they enabled young minds to glimpse the world beyond the classroom through colorful illustrations and stories of everyday life. Students want to see themselves interacting in the future, helping to shape it; and anything teachers can do in the classroom to convey this image will be received enthusiastically and remembered for many years.

Such memorable lesson plans need not restrict themselves solely to the traditional academic realm and subject areas [content]. There is a need to understand more about how subjects fit together and what can be accomplished with the knowledge and skills teachers and students already have. We have used phrases like integrated learning, technology education, or even school-to-work to describe how traditional topical learning might be transformed into process learning. This is often practiced in the workplace, but we always seem to default to the academic aspect of learning because we have convinced ourselves it can be measured with statistical certainty. Portfolio evaluation of a student's performance seems so messy and subjective, not easy to do.

If you truly believe academic credentials tell everything about a student's potential, just do an internet search around the phrase, "did not go to college," and then we'll talk. Do we go to school and higher education to show off our test scores or do something useful for our world? There is much room to bring the world of work into our schools and help prime the pump of practicality and usefulness. Let us stop engaging in a white collar/blue collar thing. Consider this quote:

From Albert Einstein:

Not everything that can be counted counts, and not everything that counts can be counted.

(www.quotationspage.com/quote/26950.html)

In this article, I should like to tweak the STEM process up a few notches, bringing the outside world directly into the classroom in a kind of real-world practicum for both students and teachers. I think it powerful to mix into the academic day outside teachers and subject/process experts who make their living in the world beyond the classroom—living, breathing adults who can speak to how school is/was important to their workplace and career activities.

For far too long, school has been about measuring "what you know." As a 44-year veteran of the engineering profession, long-time graduate adjunct faculty at two universities, visiting lecturer, and author of leadership/management books, I can state with assurance that the *workplace will ruthlessly assign value to employees based on "what they can do with what they know" and "how fast they can learn and apply new things." College test scores never enter the picture. In the world of work, subject matter content is tactical, but how to use that subject matter (process) is strategic; and global competitiveness is about having winning strategies.*

Today, the highly popular STEM educational paradigm [STEM: science, technology, engineering and math] is the initial formal fusion of content and process in K-12 environments our students will need in order to be successful in a globally competitive workplace. Based on what I have seen in local schools and taught as a special visiting teacher spanning grades 3-8, the young ones will take to this approach I champion here.

Think outside the square. Think for yourself don't just follow the herd. Think multidisciplinary! Problems by definition, cross many academic disciplines.

-Lucas Remmerswaal,
(The A-Z of 13 Habits, 2011)

All Those Educational Resources Out There

Think about the many resources you can harness for your gifted students—all those unconventional and free resources you can bring into the classroom. Make a list:

-Retired professionals	-Town council, aldermen, mayor, town engineer
-Craft workers	-Lawyers
-Artists	-Engineers
-Writers	-Scientists
-Large businesses	-Doctors
-Local businesses	

This is probably a short list. Many of these resources may be right there in your school's district or even in your neighborhood. Many of these resources may be the parents of your students. There is no shortage of great educational resources out there, just a shortage of time in the academic day and planning how to integrate all this into daily classroom activities. Have you ever tried to bring these resources in-house? How might you try this? What would your school and district think about augmenting the school's on-site resources? Could you change the academic day to accommodate this vast new resource?

Here are the key reasons to capture these resources:

---- greatly expands the scope of educational topics your gifted and talented (GT) students are exposed to,

---- shows the relevance of classroom study to real-world applications and life after graduation (making theoretical schoolwork practical),

---- STEM/STEAM paradigms come alive through examples of hands-on, team-based learning on the job,

---- makes school-to-work activities real and shows the kinds of careers, professions, and jobs where education makes a big difference,

---- shows problem solving and design to be a universal endeavor of all productive human beings, not only those with advanced degrees, and

----emphasizes the importance of teamwork and leadership in the workplace.

Don't forget that craftspeople like plumbers, carpenters, and mechanics must master the math of their professions and understand how their work affects the customers they serve, while complying with stringent and applicable municipal codes. Like engineers, craftspeople must design within constraints, and math is often the tool they use to accomplish this. Look for and capitalize on the many STEM/STEAM connections you can find within these resources.

I never teach my pupils. I only attempt to provide the conditions in which they can learn.

-Albert Einstein

(www.quotationspage.com/quote/40486.html/)

Solving Problems in our Communities

There are interesting problem solving opportunities right there in your town. These problems are multi-dimensional in nature---just the kind of challenge that GT students need. Consider the variety of people and professionals that interact to discuss potential new development projects in your town:

-Council representatives
-Mayor
-Developers
-Builders
-Lawyers
-Architects
-Engineers
-Expert witnesses [traffic, safety, environmentalists, etc.]
-Community activists
-Regulatory personnel
-Town planners
-Members of the public

All these attendees are likely to present commentary, formal presentations, evidence to support their positions and so forth. These viewpoints are rich in data and information, all factored into a mediated solution to problems in the community. This is designing within constraints, trying to reach a solution that accommodates many different viewpoints inside the company and outside as well.

The expertise listed above can be part of your classroom by inviting selected experts to talk to your students. Maybe your classroom can visit a public hearing in town to see how all these viewpoints are presented either supporting or opposing a particular position. There may be familiarity with an issue in town that your students can address in class by presenting their

ideas and conducting a mock public hearing, where they assume the various professional roles. Why not invite the town council and mayor to provide some guidance for the class to follow in conducting these sessions? Maybe there are new buildings being considered; re-development projects; traffic lights planned; or new uses for an aging facility. Students can track the project's evolution in local newspapers or via the Internet.

Perhaps the mayor and council can even suggest something they are considering and challenge your class to come up with something different and new. Contact your town leaders and invite them to be a part of the education process.

Another approach is to consider an "imaginary" project for expanding your school or adding a significant addition to it; or maybe adding a large solar power system to it. Invite neighbors into the classroom to discuss their concerns; and invite other experts like the ones listed previously and conduct mock hearings where experts can voice their concerns. First, students can develop and present their expansion plans; and as the hearings proceed, students can then modify their plans as a mediated solution emerges from comments received. This shows how multi-dimensional problem solving is necessarily an iterative process.

The principle goal of education in the schools should be creating men and women who are capable of doing new things, not simply repeating what other generations have done.

-Jean Piaget
(www.brainyquote.com/quotes/quotes/j/jeanpiaget403394.html/)

Infrastructure Lessons

Our nation's rich infrastructural network developed over about 150 years, representing the ultimate social resource for economic growth. How many of your students can identify these often out-of-sight, out-of-mind facilities? This is a huge opportunity to "STEM-i-fy" the classroom, showing how engineering achievements are so important to the advancement of our society. Let's start with a list of the major national infrastructures to consider for possible lesson plans.

- **Electric utilities**
- **Natural gas utilities**
- **Water utilities**
- **Sewage utilities**
- **Telephone/communication utilities**
- **Refineries**
- **Heating oil storage and deliveries**
- **Gasoline storage and distribution**
- **Pipelines and bulk storage terminals**
- **Offshore oil rigs, and loading/unloading facilities**
- **Docks, piers, loading terminals**
- **Chemical processing plants**
- **Transfer stations**
- **Broadcasting and satellite up/down links**
- **Military bases/facilities**
- **Ships**
- **Ports and water access**
- **Airports**
- **Railroads**
- **Highways**
- **Bridges**
- **Dams**
- **Tunnels and underwater tubes**
- **Truck and delivery vehicle depots/distribution centers**
- **Refuse, garbage, and recycling centers**
- **Police and fire departments**
- **Hospitals**
- **Libraries**
- **Charitable organizations**

Imagine the ways you can teach your students how an advanced society works and how to use this to integrate the curriculum. Perhaps your GT pupils can

- **envision new infrastructures we will add in the future,**
- **discuss the economic and social benefits these infrastructures engender,**
- **identify key issues surrounding the rejuvenation of aging infrastructures,**
- **determine when and why infrastructures developed, and**
- **investigate how these infrastructures are financed, maintained and expanded.**

Invite various infrastructure engineers and managers into your class to discuss the day-to-day operation of your town's drinking water and sewage system, for example, its design limits, environmental concerns, repair and rejuvenation, economic growth factors, etc. Delve into what infrastructure development has meant for safety, public health, and economic growth.

Much talk today focuses on our aging infrastructures and what we need to do to upgrade them on a massive scale. Have student teams concentrate on some of these infrastructures like bridges, water utilities, or dams. What kind of program would they propose to rejuvenate these important systems? What kinds of costs might we be facing? How long would this take? Emphasize the planning and organization skills in doing this.

Here is a great way to appreciate what the Internet, our newest infrastructure, has done. Engage your students in teams to discuss the pros and cons of the Internet and to identify ways it has and will continue to impact our nation and the world. Have students interview parents and senior citizens to learn how the world was before instant communications and why the Internet is such a positive force in the world from the application of STEM topics like computer science, electrical

engineering, and telecommunications technology.

How does the Internet save transportation fuel like gasoline? You can use some math to figure this out. In fact, math applies to all your classroom infrastructure discussions. How do engineers know how much "traffic" or "load" a certain kind of infrastructure can handle? What is the process for building new infrastructures or expanding others like roads, pipelines, storage/handing facilities? How is this done with the inclusion of the general public in the process? How does this all relate back to your STEM studies?

To develop a complete mind: study the science of art; study the art of science. Learn how to see. Realize that everything connects to everything else.

- Leonardo da Vinci
(www.quoteland.com/author/Leonardo-DaVinci-Quotes/900/)

How the Economy Works

So many young people have a poor grasp of how our economy works in practical terms. Bring the workings of the economy into focus for your GT students. Too often, this subject is something educational experts incorrectly expect students to pick up by osmosis, perhaps when they get into the business world. It should be carefully explained to them and reinforced often. It is a direct reflection of their basic freedoms and constitutional rights, and most everyone participates in the economy every day whether they know it or not. Here your GT students can learn how capitalism can be the greatest force for good on the planet. Consider how this topic could be discussed:

- Grown-ups who work in business or have their own companies can show through example how the economy brings about new jobs-where and why these jobs materialize; and how salaries are made available to support new workers. What are the costs of doing business that every business owner must contend with? How does a business owner hire people and what are the factors that influence hiring people?

- Where do companies get ideas for new products and why should they use the time, energy, and resources to create them? What role does the marketplace [you and your students] play in this decision-making? What are the concerns when developing and launching new products and how does this involve what young people learn in school like the technical, environmental, social, regulatory and other aspects of problem solving?

- How big is the economy that powers our nation? What are the major components of our economy (i.e., defense, education, social programs, etc)? How is the economy like a home or personal budget?

- Why is national trade and exchange important to our economy? Why is excessive national debt corrosive to our long-term future economy?

- What role does technology, invention, entrepreneurship and new business play in the economy?

Over 70% of the annual economic growth of the nation is directly attributable to advances in science and technology. Gifted students should understand this incredible engine of growth and how their future will be influenced by it. They might aspire to being a part of this by choosing a career related to technology. This proves the relevance of a STEM-based education.

These are very powerful topics that GT students should explore—topics that directly influence their lives and the lives of many others. Imagine the perspective that can be brought to the classroom as experts from outside the classroom passionately discuss how the economy works. Students will be much more likely to pay attention to matters affecting their future employment. How would you orchestrate the delivery of this message to your students?

Tell this story to your students. Connect their school world to the real world. Help them understand how they and their STEM studies correlate to the economy. This gives a perspective on how civics ties into STEM. Along the way, continually explore the math—the ultimate explanation—that puts it all in perspective.

Here is an example of breaking the ice with GT students about how our economy works.

In a free market economy, people have the unique ability to wish for and actually determine much of their future. Patents are the blueprints to convert what we have (natural resources, capital, time, knowledge, etc.) into what we want. Sometimes you can find the things you wish for in stores or catalogs; but sometimes they are not yet available. By asking for things, we give the creative inventors, engineers, business people, entrepreneurs, and financiers a clue, a heads-up, about what we are willing to spend money on. This makes people think and gets companies allocating resources. It starts the process of making dreams come true. Companies fulfill wishes, and also stimulate us to dream even more. They are the secret techniques, used to transform "dream dust" into reality. Patents are the transfer function between our dreams and what we are willing to pay to fulfill them.

If creative people listen closely and have the motivation to act on our wishes, they will attempt to turn our desires into reality in exchange for our money. It's a partnership between the market (us with our wishes and dreams) and the providers. At any time we are all free to act either in the role of market or provider. During the day at work we may be providers, making products or services for others to buy. At home, we are the markets, consuming the products and services made by others.

The future can be seen as the sum total of all our wishes and dreams. The easy ones come to exist sooner than more difficult ones. Those that are the most far reaching often define whole time periods if they come true. Consider what the collective wants and wishes for cheap personal transportation did.

It's called the car; and we certainly know what it has meant for our cities and lifestyles. Even with this, we were not satisfied and wanted to get to faraway places quickly, so we wished again---and that wish grew up and became airline travel. There was an economic incentive for creative and enterprising folks to make this dream come true, and it became possible.

Successful business people pay attention to what people are wishing for. They compete and become efficient at making dreams come true. When businesses send a marketing survey, they are interested in what you have to say, or are wishing for. This is food for their thinking and creativity. New products and services are created because someone wants and is willing to pay for them. We all have the ability to affect the future….and do.

The stock market reflects how we feel about the future. It is a kind of barometer that measures our feelings, and our desires to invest money in new things that companies are trying to produce. During uncertain times like wars and downturns in the economy, investors—everyday people like you and me—may not want to give their money to producers and instead hold onto it or invest in something else that is not risky. When times look more positive and trouble-free, many people invest in companies in the hopes of sharing their profits. If we feel positive about the future, we wish more. If we feel negative, we refrain from wishing. We are the spirit and economic stimulus upon which the great engine of our economy functions.

Summing Up

Connecting GT students to the real world is powerful and helps equip them with vital skills the work world will recognize as highly valuable. Explore all the free and expansive information close at hand. Bring experts into the classroom to help students explore and appreciate this vast information. Relevance to the outside world is powerful; and your students will certainly understand this connection, for they are natural integrators of information. Focus this natural tendency and feed their desire to understand why 12 to 16 years of schooling—fully 1/5th of their lifetime—is so important to being a lifelong learner and productive member of society!

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Creative Thinking and Its Development in the Studio Art Classroom

by Linda M. Speranza

As a visual arts instructor, I strive to meet two goals: to provide my students with the skills they are seeking in my classes and to help them learn to think more creatively. By learning to think more creatively, it is my hope that they will become better equipped to adapt to the wide range of challenges they will encounter throughout their lives.

In the general population, I suspect that most people believe that art classes are designed to develop students' creative skills; but in the art world, that assumption is not largely accepted. Rather, it is commonly believed that

- **each student comes into art classes with his or her own inherent level of creativity and**
- **art instructors are there to teach students the specific skills they will need to demonstrate that creativity.**

At a university, acceptance into an art program is tied to a favorable review of a student's portfolio; stated another way, the portfolio review process weeds out students who do not already exhibit creativity. In contrast, students in a community college art program that has no portfolio review enter with varied sets of abilities and desires. Most of the students who participated in this survey have hopes of pursuing a career in art; others, including many retirees, seek to fulfill a life-long dream of mastering an art medium. Still others simply want to convey their ideas in a given medium with no clear understanding of where they want to take the skills they are developing. The art department where I teach can point to many success stories among all of these students.

The study of creativity that I have undertaken documents creative growth among students in the entry-level art classes at Mesa (Arizona) Community College (MCC). With some 14,000 students, including approximately 1,700 students who enroll in art classes each semester, MCC is the largest college in the Maricopa County Community College District (MCCCD). Since MCC is an open enrollment college whose students self-select into the art curriculum, our nine full-time and 16 part-time faculty members teach students whose sets of skills and abilities vary from weak to strong. During a year-long fellowship that I was granted by MCCCD in 2004, I began studying creativity to document the growth of creative thought in MCC art students as they learned how to develop, plan, and create a piece of art.

After exploring creativity and creativity testing instruments, I chose to use the Torrance Test of Creative Strengths (TTCT) as my determinant of creative growth. The TTCT is a divergent thinking (DT) test that Runco and Acar (2012) identify as one of four types of creativity tests, and it tests for 5 creative strengths. The five strengths are:

- **fluency (number of responses),**
- **resistance to premature closure (ability to resist the first solution and seek out alternatives),**
- **originality (uniqueness of responses),**
- **elaboration (refinement of responses), and**
- **abstractness titles (or ability to verbalize abstract ideas).**

Creativity researchers argue about whether DT testing actually assesses creativity or the potential for creativity. As Runco and Acar (2012) have noted,

> ***There is great value in the concept of divergent thinking. Much of the research focuses on DT tests, and their reliability and validity, but additional research tells us more broadly how DT is various social and psychological factors (e.g., IQ, personality, family background) and how it is associated with problem solving, ideation, and creative potential. Ideas are useful in many aspects of our lives, and the research on divergent thinking remains useful for understanding the quality of ideas and the processes involved. (p. 73).***

In a discussion of whether the TTCT tests creativity or potential, an associate at a Science of Teaching and Learning (SoTL) conference remarked, "Well call it what you may, [the TTCT's

five creative strengths] are valuable skills; and if you can document that your students have acquired them, you have done an important service."

Creativity researchers also debate whether creativity is a "teachable" skill. In an article on the effectiveness of creativity training, Scott, Leritz, and Mumford (2004) note that the results of a study they conducted

> ***. . . lead to some compelling conclusions about the effectiveness of creativity training as well as the course content and delivery methods that make effective training possible. Perhaps the most clear-cut conclusion to emerge from this study is that creativity training is effective (p. 381).***

Initially, I conducted one semester of limited testing—enough to confirm my assumption that creative growth was indeed taking place in our classrooms. Several years after the fellowship ended, I decided to complete the study and was given a grant from MCC to test and score 14 varied sections of art classes, over a two-year period. The classes were taught by both full- and part-time faculty members, and to maintain my objectivity, I did not teach any of the sections involved in the testing. All classes were given both a pre- and post-TTCT, and participation in the project was voluntary.

My original assumption was that what we teach in our classes is effectively creativity training, as well as the acquisition of skills that can be employed in creating art. From the start of each class section through its completion, many MCC art students improved their scores in the different areas of the TTCT, and almost all of them improved in their post-test Creativity Index score (the overarching score that includes all the skills and strengths tested in the TTCT).

Although growth in all of the five creative strengths was not uniform—it varied from class to class, depending on the instructor—all classes demonstrated growth. In the pre-test, 58.1% scored in the top quartile of the Creativity Index; and in the post-test, 80.6% scored in the top quartile. At the same time, 19.4% of our students scored in the lower two quartiles of the Creativity Index in the pre-test, and only 6.4% were in the lower two quartiles in the post-test. I have thus concluded that we are indeed reaching our students and helping them to develop creative thought. This fits the description that was given in the article by Scott et al (2004).

> ***Nonetheless, the evidence accrued over the last 50 years does suggest that divergent thinking, as assessed through open-ended tests such as consequences and alternative uses [the TTCT] . . . does represent a distinct capacity contributing to both creative problem solving and many forms of creative performance (p. 363).***

Although Runco and Acar do not resolve whether the TTCT is testing creative potential or creativity, I believe they validate the usefulness of the TTCT in assessing the acquisition of valuable life skills. It is clear that our art students have been developing their creative problem-solving abilities.

However, the testing also revealed unanticipated deficiencies among our students. The TTCT strength in which our students showed the least growth was fluency. But it should be noted that our student population came in with very low skills in that strength area. Even in post-testing, many of them did not grow in fluency as much as they did in the other strength areas.

It is interesting to note that many MCC students had very strong scores in the area of elaboration, perhaps at the expense of fluency. While reviewing test scores, it became clear to me that students were overworking ideas; in other words, they were "spinning their wheels." I believe that this is due to many art students being rewarded for doing one particular thing well and not being rewarded or supported for developing their abilities and ideas in greater depth. Constantly rewarding the one area of strong competency produces art students who repeat an image or utilize a skill without being able to think of alternatives in situations that do require idea development.

Scott and his colleagues found that effective creativity training involves structured practice to apply the skills and underlying principles (2004). As to why art studio classes aid in the development of creativity, I can only posit that studio classes are set up to provide the structured and directed practice to which these researchers refer. Contributing factors may include the following:

- **After every assignment, the instructor critiques each student's work in front of the whole class and suggests how he or she might improve it.**
- **The instructor normally works one on one with students during the execution of their assignments.**
- **Visual arts class periods tend to be long, from two to three hours each, and students work under the instructor's guidance.**
- **Students benefit from watching each other complete their assignments in the classroom.**

There were three specific reasons that I proposed this project:

- **To determine whether creative thinking skills are acquired in an introductory level art class along with the expected skills that students are developing,**
- **To provide accountability of such to MCC administration, and**
- **To report on creative strengths and challenges to other MCC art faculty members.**

My background is in studio art, and the way I was trained to teach art did not address the teaching of creativity. In fact, creativity was never mentioned; it was simply assumed that either someone "had" creativity or would somehow develop it through the creation of art work. Although I have not been trained in the formal applica-

tion of Torrance's teachings, I have read some of his published work and am prepared to apply it in my own classroom. I have developed a training plan that I have incorporated into my syllabus to help students develop alternative solutions—a step, I hope, in learning how to become more fluent.

When I started my investigation I worked with one of my own class sections. My medium and what I teach is ceramics. Because ceramics requires that students acquire certain skills to translate ideas they have developed into tangible works of art, I chose a class section in which the students had completed at least one semester of ceramics. Because the class was one that students frequently repeat, I was able to follow the creative growth of some of my students for as many as four semesters.

The process I used is described below.

• Students were asked to select and share with their classmates 10 to 20 design motifs, which they could access from anywhere or create on their own. I was fine with "borrowed" images if that was what they felt comfortable showing.

• They then selected one of their designs and elaborated upon it. They were encouraged to playfully attack the design (e.g., alter it by modifying it, dissecting it, multiplying it, cutting it into pieces and reassembling it) or removing some of its components.

• They took the altered design that they felt most strongly connected with and repeated the process. Although I asked them to bring in at least 20 more modifications, I rarely got more than 10 and frequently got only 4 to 6 ideas.

• After selecting their own favorite modification from all the alterations they had produced, the students applied it in all the work they created through the remainder of the semester. Appropriate adaptation as needed for each project was encouraged.

It appeared difficult for most of the students to free themselves to grow and modify their chosen idea. They commonly got stuck on one favorite modification even though I would not permit them to make a final selection before reviewing all the designs they developed. I told them that the process was designed to develop options that they would like, that I was only there to guide them. But it was a struggle for some of them, and resistance occurred among almost all of them. Nevertheless every one of my students created an image and used it in his or her work for the semester.

This simple process helped them to understand that developing multiple ideas could improve the quality of the work they produced. Whether they had developed improved fluency was not something I formally tested, but the work the class produced using this process was consistently better than the work created by students in previous sections of the same class.

The process gave them a structured way to make work that was distinctly their own, which in turn gave them more pride in their finished products. When they learned a new technique, they already had a direction to go in as they used their imagery to develop new work. As a result, they produced work that was more creative in its design. One of my students was resistant until the final two weeks of the semester, constantly needing to be reassured and pushed. At the end of the semester, she was excited and eagerly told her classmates how she finally "got" it, how much she liked her "own design" and how pleased she was to have produced work that was uniquely her own. Feedback from other students included the following comments:

• "I did less actual work this semester, but I am much happier with the work I did."

• "This is the class that everyone should take before they move on as it gives you the ability to plan and make good work, not just stuff."

• "I have ideas that I want to grow and continue to pursue."

• "I love the work I made; my motif really gave me direction, and the work looks like I know what I'm doing."

It is clear that this approach will not address all problems encountered in teaching art students. However, recognizing the "hole" that has been most common in our student body will be useful in devising ways to help other students at MCC. On a personal note, by learning how to score and actually scoring more than 100 TTCTs, I have in fact become more fluent in my ability to assess students' limitations! My project will be extended as I am currently developing a learn-shop that will be open to all MCCCD faculty members in the coming year.

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Creativity and Innovation in an Interdisciplinary and Multicultural World: Culinary Ingenuity for Health's Sake

by Robin Lynn Treptow

As Biernes (2005, p. 62) observes, "human beings have a long history of applying their creative abilities to their personal and social survival in unceasingly new and interesting ways". Towards this challenge—in realms of nutriments, ecological welfare, and multicultural sensitivity—the current treatise is undertaken. Nutrition's sustenance is vital to life: its purviews reveal a creative persistence towards a world of no death. This could well be pulled off with multicultural eco-friendly flair—using global and holistic processing and plain hard work (Nijstad, De Dreu, Rietzschel, & Baas, 2010).

To sketch out this grand scheme, three goals unfold: 1) framing how creativity might inaugurate authentic survival-focused living; 2) showing ethically motivated plant-based diets to be an *apropos* creativity-oriented goal; and 3) applying arguments one and two towards survival of *Homo sapiens*—individual and communal—using creativity-inspired living. The tenets are approached sequentially. Thus, I first use *everyday* creativity to tug at the edges of death's presumed certainty; next, I touch on plant-based cuisine's ethical/health superiority; and from thence, I draw out a value-based "plan hierarchy" wherein items one and two operate. A central line of reasoning is that humans' innate creativity (see Schmid, 2005a; also Nijstad et al., 2010) grants ample latitude to "conquer death by living well." Dialogue adheres to these assumptions: 1) humans possess innate, unlimited creativity; 2) virtue-based multicultural living is a highly desirable good; and 3) death is not inevitable—but, rather, a solvable human problem. All operates from a premise that "…being creative…involves imaginative thought, general knowledge, and some mastery of the medium and the necessary skills" (Schmid, 2005a, p. 6).

Everyday Creativity—An Effective Means to Authentically Live *Sans* Death?

There is no better era than now to boldly try out *Homo sapiens'* capability to conquer the plague of death via gustatory delight informed by wise choices. As Satter (2007) remarks, "few cultures have settled for basic survival and have, instead, endeavored to find food preparation methods that enhance the gustatory rewards from eating" (p. S144). The situation is an ancient peril turned modern—scarce food and drink for many of the world's inhabitants (de Boer & Aiking, 2010) amidst epidemic 'globesity' (World Health Organization, 2014) for myriad others. Dietary focus on animal-based proteins threatens global homeostasis with resultant food insecurity (Joyce et al., 2012; de Boer & Aiking, 2010) that destabilizes transnational prosperity and tugs at our psyche. No wonder fear of death—viewed by psychoanalyst Firestone (2014) as the "ultimate resistance" to living well—debilitates and unnerves with *(conscious and out-of-awareness)* thoughts about death (see Pyszczynski, Greenberg, & Solomon, 1999; also Hayes, Schimel, Arndt, & Faucher, 2010).

But what if death's dire outcome is merely "self-fulfilling prophecy" gotten out of hand (see Wurm, Warner, Ziegelmann, Wolff, & Schüz, 2013) or "universal learned helplessness" (see Abramson, Seligman, & Teasdale, 1978) gone awry *en masse,* so that no one believes death can ever be mastered outright? Recent literature reveals wiggle-room in the "cut-and-dried" pathway to death's finale. Patterns like positive and negative cognitive habits linked, respectively, to healthy and unhealthy behaviors (Wurm et al., 2013; Meisner & Baker, 2013); cognitive and physical declines attributed to "growing older" (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf & Smith, 2009) rather than "disuse" as fitness expert Peterson (2008) suggests is the case; and anticipated decreases in subjective well being with greater age (Ryff, 1991) match self-fulfilling prophecy and universal learned helplessness worldviews. Additionally, perceived lacks of control impact functional health, cardio-metabolic risk, and physical activity (Infurna & Gerstorf, 2013; 2014). People expect to die and so choose unhealthy behaviors (e.g., eating poorly)—thinking that nothing can be done (see Goldenberg & Arndt, 2008).

Against this sobering (yet erstwhile hopeful) backdrop—*"death exists now but must be conquered"*—I juxtapose reflections from the initial two chapters of Therese Schmid's (2005a; 2005b) edited book, *Promoting Health Through Creativity.* Her key concept is mundane (ordinary) creativity—which per Nijstad and others (2010) "helps us to adapt to changing circumstances, to solve everyday problems, and to create new opportunities" (Runco, 2004). Noting that industrial development has diminished it, Schmid (2005a; 2005b) makes broad-reaching contention for

commonplace creativity's [present and potential] role in human health and well-being. Per a homeostasis-derived model, she avows that, "[b]eing appropriately creative can restore the balance and can help to restore self-esteem and life satisfaction and consequently health, paralleling the health-normalizing benefits of appropriate nutrition and exercise" (Schmid, 2005b, p. 48). This extends her earlier claim that, "[o]nce creativity is *demystified* [emphasis added], [people] understand that there is a deep human need for creativity and that it has strong connections with health and well-being through self-esteem" (Schmid, 2005a, p. 4).

Maintaining that "…[l]ittle argument can be made against the proposition that creativity is *essential* [emphasis added] to health and well-being" (Schmid, 2005a, p. 16), Schmid interweaves her main premise: "[a] n emerging area of creativity research, termed 'everyday creativity research', views creativity as *a survival capacity* [emphasis added] which allows all humans to adapt to changing environments" (Schmid, 2005a, p. 10). Later, defining *"survival"* as to "continue to live or exist," she remarks, "[s]urvival is the primary drive of humans and of animals. Survival is *dependent upon the capacity to be creative (or adaptive)* [emphasis added] through occupations and activities" (Schmid, 2005b, p. 30).

Ne plus ultra to Schmid's perspective is that *"to be in balance* [emphasis added] is essential to human health….[yet]….humans are not necessarily conscious [emphasis added] of their health and survival needs" (2005b, p. 41). She also points out that, "the mundane view of the word *everyday* has brought a stigma of unimportance to everyday creative activity. These views and beliefs have been obstacles that, over a long time, have inhibited many people from being creative and from enjoying the benefits to health and well-being that derive from creative activity, especially in everyday activities" (2005b, p. 46). This creativeness downturn is made poignant by her remark that "[t]he humanists have observed that a creative person is one who is fulfilled, is self-actualized and is functioning freely and fully" (2005b, p. 43). Intertwined within the discourse is awareness that governments and health agencies view the "health determinants of our society as 'multi-causal'. Disease, disability and, ultimately, death are seen to be the result of human biology, lifestyle and environment, including social factors" (Schmid, 2005b, p. 48).

Seeing that "layers of sociocultural values and knowledge have minimized creativity in our everyday thinking," Schmid (2005b) suggests that "[t]he choice as to whether to use the creative capacity has been sidelined by the l*ack of the practical necessity and survival pressure to use it* [emphasis added]. It has also been sidelined by the sociocultural values that suggest that it is not important enough to be *the subject of conscious effort* [emphasis added]" (p. 48). It is, therefore, by means of restored purposeful awareness of survival-based creativity that a multicultural and ethical dietary paradigm is proposed. Applying appetite's pleasures assiduously with cognitive flexibility and persistence (Nijstad et al., 2010) is the suggested medium.

Creativity for Health's Sake—Can It Induce Ethical Eating Habits?

I have endeavored—largely by means of Therese Schmid's (2005a; 2005b) clever discourse—to stress how creativity's unique proficiencies (e.g., having ideas and putting them into practical application) gain humanity sufficient dexterity in "living or continuing to live" (versus "living only towards ultimate physical demise"). Creativity's health impact is best expressed in everyday activity, and there is no more central an occupation than eating. Its "[i]nner experiences include the sensations of hunger and appetite, anticipatory excitement and arousal, sensory response to the organoleptic [sensory organ relevant] qualities of food… [and] intimate emotional contact with the self" (Satter, 2007, p. S144). And its associated engagements of planting, growing, harvesting, buying, planning, cooking, table décor, good conversation, and so on stimulate divergent sensorial inputs (e.g., visual, olfactory, kinesthetic, gustatory, auditory) and tap creativity's core. What is more, geographical/regional ethnic "flavored" cuisines—unique, intriguing, and inspiring comestibles—build community cohesion, make prudent use of indigenous crops, and inspire travelers from afar (Richards & Wilson, 2006). Even multicultural gatherings and the foods themselves—particularly when interspersed with elements of culture (see Leung, & Chiu, 2011)—stir creativity's knack!

But where falls the import of a plant-based diet rich in high-nutrient vegetables, fruits, and fibre-dense whole grains? Animal-based foods threaten culinary traditions, social justice norms, and care for nature—though consumers seem marginally aware of food-related values, attitudes, and practices beyond health concern (de Boer & Aiking, 2010). Preventive health agencies advocate plant-based nutrients. And physician Philip Tuso [and colleagues] (2013) opines that "[h]ealthy eating may be best achieved with a plant-based diet…a regimen that encourages whole, plant-based foods & discourages meats, dairy products, and eggs as well as all refined & processed foods" (Tuso, Ismail, Ha, & Bartolotto, 2013). Facts about these antioxidant-laden nourishments are a decade old (see Joseph, Nadeau, & Underwood, 2002); yet lack of mastery [e.g., knowledge; comfort] remains a notable barrier to healthful eating (Joyce et al., 2012; Satter, 2007; Tucker et al., 2011).

Whole-hearted human engagement with plant-based eatables would profit world harmony (i.e., animal-based proteins undermine Earth's ecological macrosystem; see de Boer & Aiking, 2010; also Joyce et al., 2012). It would be a gain for creatures whose lives are thereby retained without constraint (i.e., the burden and suffering from egg-laying for cooped up hens, milk production for stanchioned cows, and the veal market for male calves). Erasing meat's centrality grants broader influence to

spices, textures, flavors, and sundry other culinary satisfactions. Burgeoning cookbooks, websites, and recipe-rich blogs belie the doubter's claims that a plant-based diet lacks variety, verve, or vigor of victual. Cashew nut sauces swelling with succulent mushrooms, seitan chunks in tangy barbecue on buns, and tofu-tumeric 'omelets' might well entice the penchant of distrustful skeptics keen on carnivorous chow. Supermarket shelves, coolers, and freezers showcase entrepreneurial plant-based nutritional variety.

Still, Biernes (2005, p. 64) notes that, "[p]reparing a meal depends on our ability to peel, stir, lift, and pour before the guests can be invited and the celebration begun." And in research cited by Joyce and colleagues (2012, p. 4), "the main barrier [42%] to eating a plant-based diet was lack of information…on nutrition and preparation of plant-based foods." Virtue-laden dietary change seems a miniscule investment of creative genius—but to bridge consumers' wide psychological gap (see de Boer & Aiking, 2010) means no longer joining in the death or inconvenience of another [i.e., an animal] to fill one's belly. *Wanting* to eat nutritious food is an internal dynamic—arising from *learning to genuinely like* that food (Satter, 2007). And, "[i]nvention, the essential result of creativity may only occur when we have mastery of the necessary underlying skills upon which we can rely" (Biernes, 2005). Food acceptance attitudes and behaviors (Satter, 2007) progress from curiosity and inclination to experiment with novel food (e.g., examining it, watching others eat it, repeatedly tasting it) to eventually being comfortable enough (e.g., taste and texture) to enjoy and include it in one's dietary repertoire.

Creativity Imbued Virtue—A Global "Path Hierarchy" Towards Vibrant Health?

As just discussed, among the numberless daily tasks in which innovation can be expressed for good, eating and its pleasurable accouterments hold much sway over the human psyche. Scant other pursuits offer so great a pull towards survival in its highest form. Consuming food is essential. Moreover, gustatory fervor unites our minds' cognitive, affective, and conative threads (Satter, 2007). Simple evidence puts eating on each rung of Maslow's self-actualization schema—making the culinary arts exceptional in ability to coalesce humans' *joie de vivre.* To accelerate eating's purview of good well past "survival" and move it resolutely from food (physiological) to health (safety) simultaneous with friendship/family (love/belonging), confidence/achievement (esteem/mastery), and spontaneity/creativity (self-actualization) would benefit human existence. The means I propose is a multicultural eco-friendly ethos (i.e., "plan hierarchy;" see Bowlby, 1982, p. 77-79) steered by constructive creativity rooted in virtue (e.g., temperance, prudence, justice, transcendence, courage, humanity, and others; see Dahlsgaard, Peterson, & Seligman, 2005; Wong, 2011). Creatively sustained health (i.e., a vibrant and self-actualized existence; see Schmid, 2005b) for all peoples is the "set-goal" (i.e., "…a time-limited event or an ongoing condition…brought about by…behavioral systems…structured to take account of discrepancies between instructions and performance;" Bowlby, 1982, p. 69). Per this framework, "aliveness" accrues bit-by-bit as we embrace wide-eyed our inner and outer creative geniuses towards what is best for all (i.e., altruism with a reasonable measure of self-interest: de Boer & Aiking, 2010). All alternatives must conform to *value-focused thinking*—relevant only because they are means to achieve values (Keeney, 1994). The parameters are: 1) what is good needs to be both for the individual and for the common good (Wong, 2011); 2) "not good" outcomes or actions—even for "a-single-person-at-a-single-moment-in-time"—fail the model's intrinsic criteria; and 3) living well (i.e., abundantly; virtuously) is a goal in and of itself, as it is patently unsatisfactory to "live-well-only-so-as-to-die-well". Living becomes a "mastery goal" self-regulation scenario (see Mann, de Ridder & Fujita, 2013) towards health, where, human-by-human, we choose what is best (i.e., conscientiousness; see Friedman & Kerns, 2014) even when the going is tough.

Conclusions

If it could help you, others, and the planet (see Joyce et al., 2012; also de Boer & Aiking, 2010), why not embrace a plant-based diet with gusto? This query is well analyzed by Robert Keeney's (1994) "values first" perspective where "values are the principles for evaluating the desirability of any possible consequences or outcomes" and "[t]he greatest benefits…are being able to generate better alternatives for any decision problem and being able to identify decision situations that are more appealing than the decision problems that confront you" (p. 33). He calls it "creat[ing] a win-win alternative" or "removing constraints to action" through *empathic negotiation* (Keeney, 1994, p. 40). Creativity—"an inherent property of human cognitive functioning…a case of problem solving…of finding a path through 'problem space'…that links the initial state to the goal state" (Nijstad et al., 2010, p. 38)—is joyfully requisite. To "create decision opportunities" around living in a creatively inspired healthy manner, one "convert[s] an existing decision problem [how to stay healthy until one dies] into a decision opportunity [how to continue living healthy day-by-day *sans* death]…by broadening the context" (Keeney, 1994, p. 40). It then has a ready answer in the realm of creativity—where plant-based nutriments exuding gustatory flair can tantalize the ubiquitous human craving to crack the conundrum of rampant human death.

At once bringing this essay to a close, I have attempted to do the following:

1) show that survival-focused creativity provides an as yet unexplored means to conquer death,

2) demonstrate that a plant-based diet's ethical/practical criteria

grant it ingenious *savoir-faire* to alter current patterns of "death-focused" living, and

3) elucidate a multicultural "plan hierarchy" rooted in creativity-imbued virtue as a means to end human death.

Readers can dissuade or dispute any or all of the premises, presumptions, hypotheses, and speculations as mere conjecture. But the humble fact remains that a world without suffering, disease and death—in fact, one permeated with creatively zestful living—would be blissfully better!

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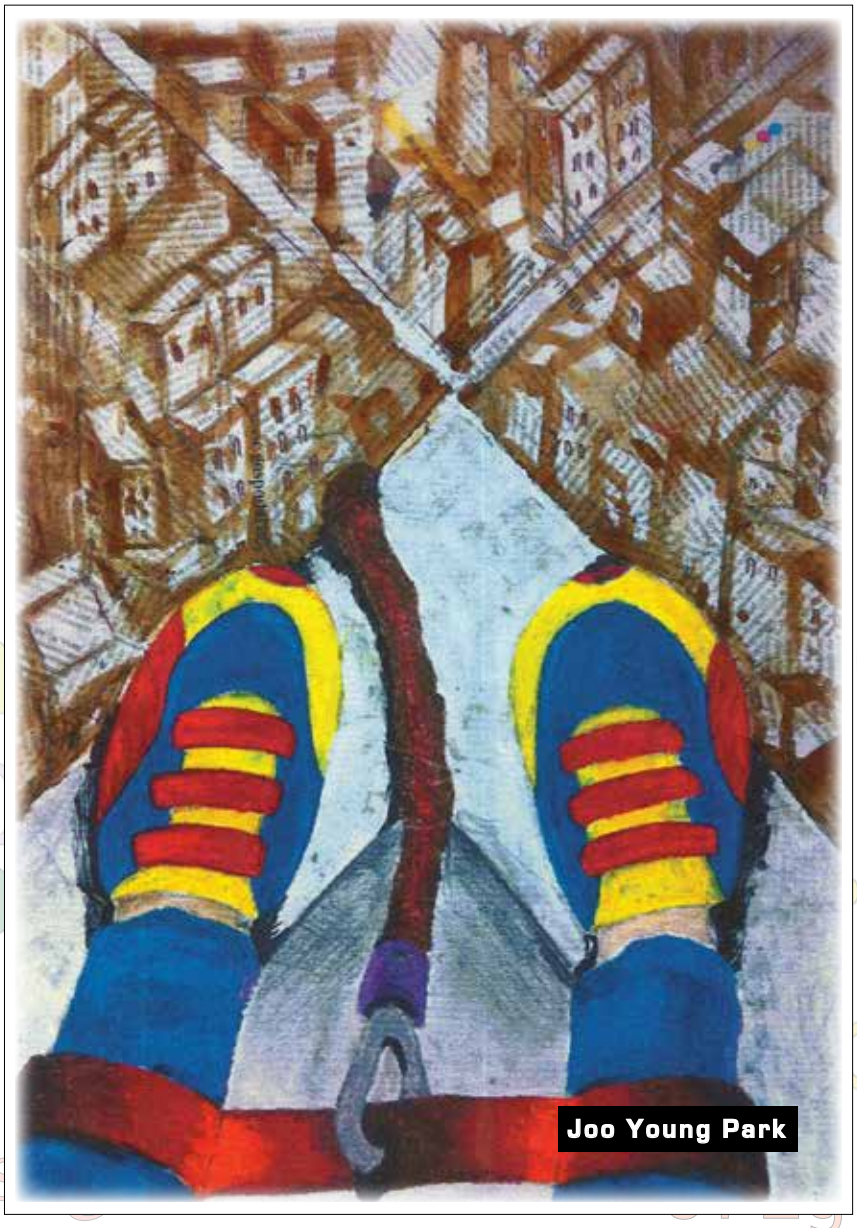
V. Creativity Applied to Psychology and Spirituality



Sylvia B. Rimm
The Fashion of Passion – What Would Dr. Paul Torrance Say?

Dorothy Sisk
Spiritual Intelligence: Developing Higher Consciousness

Kristy Kowalske, Sharon Dole, & Lisa Bloom
Studies in Psychology: Promoting Awareness of Self and Others to Nurture Spiritual Giftedness

Hanna David
A Glimpse into My Clinic: The "Associations Game" as Part of a Dynamic Diagnosis

The Fashion of Passion - What Would Dr. Paul Torrance Say?

by Sylvia B. Rimm

Dr. Paul Torrance inspired millions to think "outside the box," to play with ideas, move beyond the ordinary, plan for the future, and engage in learning and creative work. He encouraged students to take the risk of going beyond conventional boundaries in search of creative productivity. My interpretation of these messages has encouraged me to search beyond the obvious meanings of words and clichés. My contribution to this journal honoring the work of Dr. Torrance will hopefully inspire educators to guide young people toward creativity, contribution, conscientiousness, and lifelong fulfillment.

A most frequent and fashionable mantra given today by educators, parents and well-meaning counselors to adolescents and young adults is “find your passions.” It is heard and seen everywhere—at airports, in advertisements, at high school and college graduation addresses, from successful parents and teachers, and even on Starbucks coffee mugs.

Here are a few of the recent quotes and advertisements:

"Find Your Passions"

1. A poster on a public school wall: *“Do What You Love and Do It Often”*
2. A poster in an airport: *"Mia Hamm - Kicked her way to the top. Passion. Pass It On."*
3. An internet advertisement: *"Turn Your Passion into a Career."*
4. An employment ad: *"Breaking news! Schools searching for 10 educators passionate about learning!"*
5. On Starbucks coffee mugs by the famed and highly successful Oprah Winfrey: *"Follow your passion. It will lead you to your purpose."*
6. Perhaps most comically, on a giant dumpster: *"Trashin' is our Passion."*

Passions, as defined in the Merriam Webster dictionary (2007), are "strong feelings," and "emotions as distinguished from reason." We must search beyond the obvious to understand what leads reasonable and responsible adults to guide adolescents who are already at the most imaginative and emotional stages in their development to believe that they are entitled to "follow their feelings to find what they will be doing for the rest of their lives?" The appropriate term for young people who believe they are entitled to do *only* what gives them emotional pleasure is "narcissism."

Highly intelligent adults who are responsible for guiding young people are allowing them and even persuading them to follow only their own feelings, rather than combining feelings with reason and logic or accepting advice from experienced adults for determining their future directions. Dr. Gordon Marino, Professor of Philosophy at St. Olaf College questions, "Is ‘do what you love’ wisdom or malarkey?" (2014). One must explore how this irresponsible "malarkey" has become so omnipresent.

The Research That Supports Passion

Soccer player Mia Hamm is undoubtedly passionate about playing her sport and is successful as well. Teachers who are passionate about their work are actually more likely to inspire students and Oprah Winfrey is both passionate and extraordinarily successful in her career, so why not encourage this message of searching for one's passion? In a 15-year follow-up study of a sample of successful women (Rimm, Rimm-Kauffmann & Rimm, 2014), most affirmed that they were passionate about their work. Lest readers think I only quote women, I asked my husband and sons how they feel about their work. They admitted they loved their work, at least much of the time. Dr. Torrance, our hero of creativity, was surely passionate about his contributions as well. Furthermore, I am often very passionate about my work. Intrinsic motivation absolutely enhances learning and should surely be part of an adolescent search for meaning, so what can be wrong with this epidemic of advice to search for passions?

The Problems with Passion

The major problems with communicating to gifted children goals for becoming passionate about their work is that adults are either giving them a message of entitlement, or even worse, inspiring them to set their goals too high at a time in their development when they should be searching for their identity with both their emotions and their reasoning abilities.

Gifted children often internalize perfectionistic, highly competitive

pressures. Now adults have added a new pressure that causes them to believe that they must find a "perfect passion." Research on motivation (Davis, Rimm, & Siegle, 2011; Hostettler, 1989) finds that achieving children and adults set realistic expectations and those expectations build their self-efficacy. Underachievers set goals too high or too low, both of which defeat motivation by serving as excuses for avoiding effort.

There is a huge difference in the way successful adults define and understand passion in regard to their work and the way in which imaginative and emotional children understand passion. The following statements are likely to be shared by adults who realistically enjoy their work:

- "I absolutely love my work 'sometimes!'"
- "I made excellent progress on my project!"
- "My journal article was finally published!"
- "I'm making a difference and helping people!"
- "I made a sale today!"
- "I'm helping to design a bridge to alleviate traffic downtown!"
- "After many, many years of hard work and rejection, my art has finally been accepted into an art museum!"
- "My students' science project won a prize!"

Children, adolescents, and young adults hear and interpret expectations of passions very differently. Here are some examples:

5th grade boy: "I'm hoping to be a professional basketball player, but I won't play on a team because it's too competitive."

High school boy with good sense of humor: "I'm going to be a stand-up comedian."

Ninth-grade boy (with gaming addiction): "I could become a reviewer of video games. I know them all."

Semi-musically talented guitar player: "I'm following my passions and hope to become a rock star."

Or in contrast:

Sixth-grade girl: "I'm just different — you can tell by how I dress."

Seventh-grade boy: "Why doesn't the teacher teach us something we love; I don't like math, it's too boring."

Eighth-grade boy: "I plan to design video games. I absolutely hate to write. I won't do that homework. The teacher is not teaching me right."

Teenage girl: "My parents expect me to be perfect, the work is too hard."

College student: "College isn't for me. I can't find my passion here."

College student: "My passion is to become a writer, but I'm not signing up for a writing course. It will destroy my personal style."

Parents and teachers also share these messages with me in my clinic and school about students they want to help who are trying to discover their passions:

- "Our son goes from sport to sport, activity to activity, but doesn't persevere."
- "My student doesn't seem interested in anything."
- "My student just wants to get by and do the least he can."
- "I can't drag my son away from computer games."
- "My daughter won't take notes, but instead draws. Her passion is art and I think she should not have to take notes. I want her to follow her passions."
- "My son has good musical talent but won't take lessons. Instead, he thinks it's important to just play for himself."

The Sad Effect of Too High Expectations

Young people who have internalized too high expectations will feel extraordinary anxiety or are at high risk for depression, with some experiencing both. Anxious children may habitually avoid effort and competition. Examples of such avoidance include the boy who won't even try to play on a basketball team although he loves the sport; the child identified as gifted who refuses to be in the gifted program because she doesn't think she is smart enough or the writer who won't take a writing course because he fears criticism. Children who go from one activity to another and quit as soon as an activity becomes difficult are searching for their passions, but they equate passions with finding tasks easy and fun. When they fear failure, they discontinue the activity because they no longer believe the activity is their passion.

Examples of depressed children include those who give up on joining any activities or who refuse to do homework. One very talented young woman set her heart (and passion) on becoming a solo violinist until she found her talent was only sufficient to play in a symphony orchestra, but not as a soloist. She became so depressed that she could no longer even listen to music although music had been her passion during her entire childhood.

Passions Should Be Tempered With Reason

Some children feel passionate about unrealistic dreams for their futures, while others can't seem to become engaged in activities at all. The first are at risk of depression; the second are likely to become underachievers (Rimm, 2008) because they are so fearful of making the effort.

For those young people who are intensely involved in exclusive activities that they hope will lead them to a career, educators and parents can help them to investigate opportunities toward pursuing careers they may feel passionate about. Acrostic REAL (Figure 1) encourages students to be strategic, emphasizes a growth mindset (Dweck, 2006), and encourages realistic expectations (see figures at the end of this article).

For those students or children who are already engaged in their passions which will lead to careers that are too competitive and likely go beyond their talents, Figure 2 provides reasonable strategies for dealing effectively with their interests without destroying all hope for their career directions. Only a very small percentage will be success-

Figure 1:

Don't Steal Their Dreams, but Temper Passion with Reason!

Realistic: Are there ***real*** career opportunities?

Effort: ***Effort*** and perseverance are appropriate mindsets.*

Adolescents: ***Adolescents*** need to become resilient.

Learning: ***Learning*** to be strategic is important.

*(Dweck, 2006)

ful (Rimm, Rimm-Kauffman & Rimm, 2014) and should be encouraged to follow their talent.

Parents may invest thousands of dollars in specialized teachers, lessons, and opportunities for their children if they overestimate their talents and wish them to only follow their passions. Being realistic and understanding children's limitations can save them frustration and heartbreak down the road.

Students Who Are Not Engaged In Anything

Children who wander from activity to activity or who give up as soon as they meet a challenge can be lured toward engagement by much less extreme words than "passion." Parents often try to encourage them to join an activity by making such statements as, "You'll probably be really good at basketball if you just try." Although parents don't intend these words to cause pressure, anxious children typically interpret them as impossibly high expectations. Encouraging them to join in activities to develop friendships can assist them in getting started. Teaching children that a strong work ethic will help them to find their strengths and assuring them that there is time to explore their interests and capabilities will give them courage. Finding work experiences or mentors who inspire children can help them discover their interests. Figure 3 with its emphasis on interests, rather than passions, encourages children to become engaged in learning and to persevere.

Figure 2:

Strategies for Students with Passions in Highly Competitive Careers

Practice: **Practice, practice** passion area, so you determine the extent of your talent.

Alternative: Develop **alternative** skills in case passion opportunity doesn't work out.

Strive: **Strive** to win in competitions, and join collaborations to compare your talent.

Skills: Select coaches to teach you high-level **skills**.

Install: **Install** a deadline for rethinking alternative career directions.

Opportunities: If **opportunities** are not realistic, select other direction.

Never: **Never** stop enjoying your passion, but make it into your hobby.

Figure 3:

Strategies for Students with No Specific Interests

Interests: **Interests** can guide you.

Negotiate: **Negotiate** time to examine interests thoroughly.

Test: **Test** new activities with friends.

Explore: **Explore** multiple extra-curricular activities.

Raise Grades: **Raise** grades by working hard on school subjects.

Experiment: **Experiment** with part-time and volunteer jobs.

Search: **Search** for mentors and observe their work.

Tutor: **Tutor** young students to build confidence.

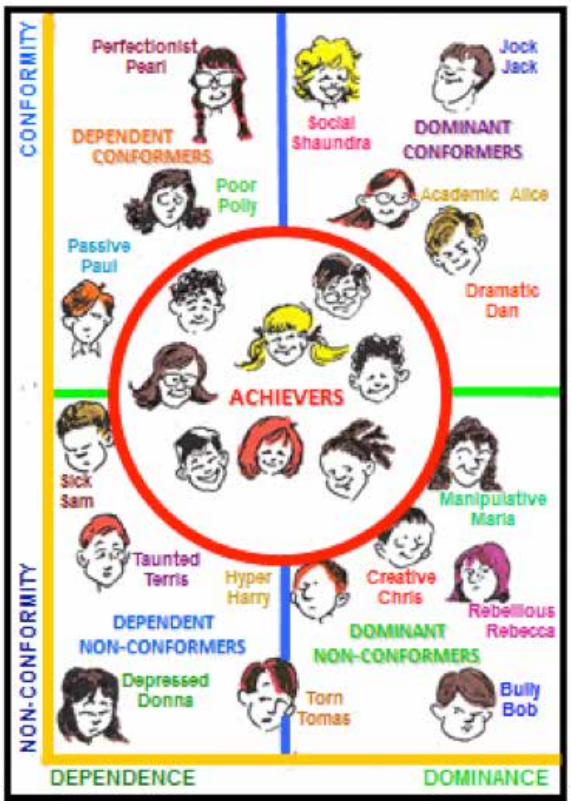
Serendipity: **Serendipitou**s events or meetings can lead to opportunities.

Too High Expectations Lead to Underachievement

Figure 4 describes the paths that many gifted and creative children take when they feel extreme pressure to accomplish what they fear they are unable to achieve. I have excerpted here pages from my book, *How to Parent So Children Will Learn* (Rimm, 2008), that describes this figure:

Figure 4

The Inner Circle of Achievers



The children in the inner circle (figure 4) are achievers. They've internalized a sense of the relationship between effort and outcome—that is, they persevere because they recognize that their efforts make a difference. They know how to cope with competition. They love to win, but when they lose or experience a failure, they don't give up. Instead, they try again. They don't view themselves as failures but only see some experiences as unsuccessful and learn from them. No children (or adults) remain in the inner circle at all times; however, the inner circle represents the predominant behavior of achieving people.

Outside the circle are prototypical children who represent characteristics of underachievement. These children have learned avoidance and defensive behaviors to protect their fragile self-concepts because they fear taking the risk or making the efforts that might lead to less-than-perfect performance.

The children on the left side of the figure are those who have learned to manipulate adults in dependent ways. Their words and body language say, "Take care of me," "Protect me," "This is too hard," "Feel sorry for me," "I need help." Adults in these children's lives listen to their children too literally and unintentionally provide more protection and help than children need. As a result, these children get so much help from others that they lose self-confidence. They do less, and parents and teachers expect less. They become expert at avoiding what they fear.

On the right side of the figure are the dominant children. These children only select activities in which they feel confident they'll be winners. They tend to believe that they know best about almost everything. They manipulate by trapping parents and teachers into arguments. The adults attempt to be fair and rational, while the dominant children attempt to win because they're convinced they're right. If the children lose, they consider the adults to be mean, unfair, or the enemy. Once the adults are established as unfair enemies, the children use that enmity as an excuse for not doing their work or taking on their responsibilities. Furthermore, they often manage to get someone on their side in an alliance against that adult.

Gradually, these children increase their list of adult enemies. They lose confidence in themselves because their confidence is based precariously on their successful manipulation of parents and teachers. When adults tire of being manipulated and respond negatively, dominant children complain that adults don't understand or like them, and a negative atmosphere becomes pervasive.

The difference between the upper and lower quadrants in Figure 4 is the degree and visibility of these children's problems. Children in the upper quadrants have minor problems which they often outgrow. Parents who understand the potential for their worsening can often prevent them from escalating. If upper-quadrant children continue in their patterns, however, they will likely move into the lower quadrants. Most of the dependent children will, by adolescence, change to dominant or mixed dependent-dominant patterns. There are also some children who combine both dependent and dominant characteristics from the start.

Dependent and dominant children practice these control patterns for several years before they enter school. It feels to them that these behaviors work well, and they know of no others. They carry them into the classroom and expect to relate to teachers and peers in the same way that they have to their family. Teachers may be effective in improving some of the children's ways of relating; however, the more extreme the dependency or dominance, the more difficult it is to modify. Furthermore, teachers may respond intuitively to these children in ways that only exacerbate the problem. The dependency pattern often disguises itself as shyness, insecurity, immaturity, inattentiveness, or even a learning disability. Teachers may also protect these children too much.

The dominant pattern does not always show itself in the early elementary grades because the child feels fulfilled by the excitement and power of school achievement. Dominance may also be exhibited as giftedness or creativity, or, not so positively, as ADHD or a discipline problem. If it shows itself as a discipline problem, teachers may label these children negatively. The children may end up sitting next to the teacher's desk or against the wall with a reputation as being the "bad" kid of the class. Parents often refer to a dominant child as strong willed or stubborn.

Even if some teachers manage these children well in school, the dependent or dominant patterns may continue to be reinforced at home or in other classrooms. As time goes on, dependent and dominant children are likely to become underachievers because their self-confidence is built on manipulating others instead of on their own accomplishments.

In granting children appropriate power, we must give them sufficient freedom to provide them with the courage for intellectual risk-taking. However, we should also teach sufficient humility so that they recognize that their views of the world are not the only correct ones. Although we need to empower them enough to study, learn, question, persevere, challenge, and discuss, we cannot grant them so much power that they infringe on

adult authority for guiding them. That authority is indeed more fragile for this generation's children than it has ever been (p. 14-17).

For children with long-standing patterns of underachievement, adults make better progress by responding counter-intuitively. If children's goals are to be "most creative," "brilliant" and "best," or to "find their passion," and if they believe that reasonable goals will not be satisfying for themselves or for those who love them, they will either listen to compromise and reset their goals to be more moderate with maturity, or they will continue into life as frustrated adult underachievers (Rimm, 1994). Here are 3 case studies:

***Case study #1:**

Andrew had an early history of underachievement probably related to being both gifted and learning disabled. Math had never been his strength, but he was an excellent thinker and a very verbal young man. In high school, he had reversed his underachievement, earned excellent grades, was a star in creative drama, and had taken the initiative to build a "spook house" business that had been extraordinarily successful. He had netted a $10,000 profit from his enterprise. His motivation, hard work, imagination, and creativity were remarkable and earned him an excellent scholarship for college. His successful entrepreneurship motivated him to follow his passion to major in business.

Andrew earned A's and B's his first year in college for his introductory business courses, but his second year included multiple math courses which caused him severe problems. TV screens, video games, and socializing distracted him from his main agenda and the pressures of a broken romance and poor grades lead him to panic attacks and suicidal ideation.

Counseling and perseverance helped Andrew temporarily put his past girlfriend in perspective, decrease screen time, and bring reasonably successful closure to his semester. A family session was intended to help Andrew set new realistic goals. Both parents were involved and they were discouraged and worried about their son. Andrew explained that he thought he should quit college and develop "spook houses" as an enterprise because he believed he could make them into a successful lifelong business.

Both parents wanted Andrew to complete his college degree. Very reasonably, they were trying to guide him toward taking classes in his areas of strength, and exploring new interests to manage his stress and to give him alternatives for his future. His very educated and intelligent father urged Andrew repeatedly to search for his "passions." Unfortunately, his loving father did not realize that his well-meant message to Andrew to find his passions was actually the message that he hoped to follow by dropping out of college. His extraordinarily successful one time entrepreneurial experience with the spook house was the emotional high he preferred to follow. A full college education would have given him more realistic choices for a good career for the rest of his life. Andrew was not passionate about studying and did not respond to his father at all. He believed that he had already discovered his passion and he saw no reason for a further search or study.

* This case study has been altered to protect privacy.

Case study #2:
Letter from an adult who is still searching for her passions:

I discovered your literature while searching the Internet for insight into my life (as an adjunct to formal therapy), and what was written in your book, *Why Bright Kids Get Poor Grades And What You Can Do About It* (Rimm, 2008), resonated strongly with me. Parts of this book felt like a narration of my own life. Unfortunately, as a 30-year-old, the period of my life that aligns with that which you describe in your book is now over.

I have been told that I am "smart" and "bright" and I was enrolled in gifted programs in school, but I have always been plagued by chronic perfectionism, avoidance, and low self-esteem. Unfortunately, my achievement (or lack thereof) thus far in life reflects that. Are there resources available that detail any recourse for an adult who never reversed their underachievement problem?

Case Study #3:
Another letter concerning a search for passions:

At the age of four, I was labeled through testing as being gifted. I was then "branded" the genius of the family which often made me the center of attention. This caused me to place a huge amount of pressure on myself, and my mom also pressured me to be the first in my family to earn a college diploma. I was praised by adults for being smarter than others and kids who did not like hearing this shunned me. I even felt shunned by my siblings.

I have found it difficult to be "successful" in any profession and I feel a constant urge to move on when I reach a wall. I am a "Jack of all trades, but a master of none." First, I was a short order cook and then I tried sales and sold furniture, cars, and hi-fi equipment. I love customer service because I meet new people, learn their life stories, and they help me to remember that my life is not so bad.

On the other hand, my scientific side loves space, the stars, and learning about the physical universe. I also find myself to be passionate about the spiritual universe and the weird and wonderful ways it works. My greatest passion will always be music.

I continue to try to find out who I am. What I understand now, with your help, is that my aims are not too high. I have cruised through life just being mediocre in what I am faced with. I work hard, but not as hard as I could. I know that I can achieve success, but I put too much pressure on myself thinking that I have to be the best at whatever I set out to do. I just wanted you to know that those traits you spoke of do continue into adulthood. They can be strengthening, but can also be detrimental to motivation.

Graduation Message

I have heard many educators direct students to find their passions. Many parents have reminded me how much they want their children to be happy and find their passions. I have also heard multiple graduation addresses from middle school through university level that have urged graduating students to search for their passions. In contrast, excerpts of my favorite and most meaningful graduation address given by Dr. Steven Muller at Johns Hopkins University (Rimm, 2008, p.18) present another view:

> As we congratulate you on your academic attainments and wish you well, it also seems more timely than ever to remind you… that you have received here a great blessing, and that therefore you bear as well a great responsibility. Whatever your field of study, you have been blessed by academic freedom in all fullness.
>
> But let me also remind you that knowledge alone is not wisdom; that information is a means, not an end; that the object of free inquiry is truth, not profit; that freedom without responsibility is animal anarchy.

Finally, Figure 5 summarizes my Top Ten recommendations for gifted young people to realistically and creatively steer their lives toward meaningful careers. They can guide young people toward developing their strengths, engaging in their work, making real life contributions, appreciating the education they have been given, achieving reasonable happiness, and being able to support themselves and their families. It invokes both the freedom and responsibility advocated by Dr. Muller. I believe that Dr. Paul Torrance would also likely approve of my clinically experienced and researched advice to young people that can lead them toward creative and fulfilling lives. As contributing adults who have set reasonable goals, they will likely also feel passionate about their work at least part of the time.

Figure 5:

My Top Ten Recommendations for Gifted Students to Fulfill Their Potential

1. Interests: Find a career that utilizes your strengths and interests.

2. Hard Work: Expect to work hard and persevere.

3. Competition: Good careers are highly competitive. You will win and lose, succeed and fail.

4. Independence: Don't expect everyone to like and praise you. No one is perfect.

5. Humility: You will start at the bottom and are more likely to succeed if you help your supervisor to become successful.

6. Responsibility: Earn enough to support yourself and your family.

7. Tradeoffs: Life always involves some tradeoffs. You will need to make compromises.

8. Contribution: Make at least small contributions to our world. It needs your help!

9. Contribution: If you are highly successful financially, please give some back to those who made your success possible.

10. Reason: Following only passions is irrational. Uniting reason and emotion will allow you to enjoy your work some of the time.

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Sylvia Rimm is a psychologist, the director of Family Achievement Clinic in Cleveland, Ohio, and a clinical professor at Case Western Reserve School of Medicine. Her books, *How to Parent So Children Will Learn* and *Why Bright Kids Get Poor Grades,* were both 2008 National Best Books award winners from USA Book News. Dr. Rimm has authored many other notable books, including *Keys to Parenting the Gifted Child, Raising Preschoolers, See Jane Win®, How Jane Won,* and *See Jane Win for Girls.* She is also co-author with Gary A. Davis and Del Siegle of the textbook, *Education of the Gifted and Talented,* now in its 6th edition.

Spiritual Intelligence: Developing Higher Consciousness

by Dorothy Sisk

When E. Paul Torrance and I began discussing the possibility of exploring the concept of spiritual intelligence and writing a book on developing higher consciousness, we received a myriad of responses, mostly negative. However, one colleague, Abraham Tannenbaum from Teachers College at Columbia University sent an email saying, "I wanted to write such a book," and later, from the podium of the Texas Association for the Gifted and Talented, he zealously shared that same sentiment to over 5,000 participants. However, one of the more negative statements concerning the existence of spiritual intelligence came from Howard Gardner in *Intelligence Reframed: Multiple Intelligences for the 21st Century* (1999) in which he said, "Any discussion of the spirit--whether cast as spiritual life, spiritual capacity, spiritual feeling, or a gift for religion, mysticism or the transcended--is controversial within the sciences, if not throughout the academic world." He further stated, "Regrettably the scholars in the cognitive and biological sciences turn away from questions of a spiritual nature, consigning this realm to the true believers and quacks" (p.53). Later, when our book *Spiritual Intelligence: Developing Higher Consciousness* was published in 2001, another colleague, Linda Silverman, Director of the Gifted Development Center in Denver brought toy ducks to a National Association for Gifted Children session, and their "quacking" preceded our workshop on Spiritual Intelligence. Since that time, Howard Gardner has considered moral intelligence and existential intelligence as an extension of the original Multiple Intelligences.

Paul and I were convinced that a foundation for spiritual intelligence needed to be established, and that this could be accomplished by exploring Psychology, the Sciences (notably Biology, Physics, and brain research), and Ancient Wisdom and Eastern Mysticism, including the Wisdom of Native American and indigenous people. We began our search for the core capacities, values, and experiences for what could be conceptualized as spiritual intelligence. We searched for the key virtues, the symbolic system, and the brain states which were the areas Howard Gardner used to identify and establish his original multiple intelligences. An amazing journey of exploration evolved from our decision to seek a strong foundation for the concept of a spiritual intelligence. When academics in numerous fields learned of our quest, they generously offered articles and books, including an entire set of the *Upanishads;* the Center for Brain Research in San Diego opened their lab and shared their latest research data on investigations of the temporal lobes as a possible site for spiritual experiences.

This article will explore a foundation in Psychology, including Carl Rogers' (1980) characteristics of the *Person of Tomorrow* in which he listed a yearning for the spiritual; a foundation in Science with Candace Pert's (1997) concept of the *bodymind* and the *conscious universe* introduced by Braden (1997); and a foundation in Ancient Wisdom, Eastern Mysticism, and Native American and Indigenous cultures that emphasized using visions to gain wisdom. From this exploration, a definition of spiritual intelligence emerged. This article will discuss the importance of developing and nurturing spiritual intelligence in the classroom with a focus on service learning, and will include several examples of students in their quest to serve others. It will conclude with a section on ways to develop or raise spiritual intelligence which can be applied to children, youth, and adults. The first exploration was in Psychology.

Foundation of Psychology

The theories and scholarly work of psychologists Carl Jung (1969), Kazimierz Dabrowski (1967), Carl Rogers (1980), and Abraham Maslow (1968) were examined to build a foundation for the concept of spiritual intelligence. Several concepts emerged from this examination that strengthened a concept of spiritual intelligence. Dabrowski's Level V of development in which individuals live a life in service to humanity, according to the highest universal principle of love, compassion, and worth of others, represents what Sisk and Torrance (2001) identified as the core behaviors of spiritual intelligence. Dabrowski described individuals with superstimulatability who manifest spiritual intelligence and demonstrate self-actualization as described by Maslow (1968), and the qualities of the *Person of Tomorrow* as described by Rogers (1980) in Table 1.

Table 1: Qualities of the Person of Tomorrow

QUALITIES OF THE PERSON OF TOMORROW
1. Openness (open to new experience and ways of seeing and being)
2. Desire for authenticity (value of open communication)
3. Skepticism regarding science and technology (distrust of science used to conquer nature and people; sees science used to enhance self-awareness)
4. Desire for wholeness of life, body, mind, and spirit
5. Wish for intimacy, new forms of communication, and closeness
6. Process person (aware that life is change, welcomes risk-taking and the change process)
7. Caring (eager to help, nonjudgmental, caring)
8. Symbiotic attitude toward nature (ecologically minded, feels alliance with nature)
9. Anti-institutional (antipathy for highly structured, bureaucratic institutions)
10. Authority within (trusts own experiences and moral judgments)
11. Unimportance of material things (money and material status symbols are not the main goal)
12. Yearning for the spiritual (wish to find meaning and purpose in life that is greater than the individual) **(Rogers, 1980)**

People who manifest spiritual intelligence are open to a multi-sensory way of knowing in which the psychic and physical are no longer differentiated; and they are able to use the core capacities of meditation, intention, and visualization, as proposed by Carl Jung (1969).

Foundation of Science

A number of representative scientists were examined including, neuroscientist Candace Pert (1997), geologist Greg Braden (1997), physicists Fritjof Capra (1991) and Neils Bohr (1999), and brain researchers Rodolfo Llinás and Urs Ribary (1993), Michael Persinger (1996), and Vilayanur Ramachandran and Blakeslee (1998). All were engaged in asking the important questions of why nature is the way it is, and where the cosmos comes from. Their work represents the classical role of science (the *search for truth* in Biology, Geology, and Physics), and their research helped to build a scientific foundation for spiritual intelligence.

Neuroscientist Candace Pert (1997) said intuition is part of the spiritual realm and there is a higher intelligence that comes to us via our molecules, resulting from participation in a system far greater than the world received from the five senses. From an examination of scientists in physics (Capra, 1991; Bohr, 1999), and in geology (Braden, 1997), there emerged a concept of a conscious universe in which we interact as a part of a continuous, connected process of unity. The brain research of Michael Persinger (1996), Rodolfo Llinás and Urs Ribary (1993), and Vilayanur Ramachandran and Blakeslee (1998) also suggested there may be an intrinsic area of the brain, the temporal lobe, that can be considered as a *brain state* of spiritual intelligence.

Foundation of Ancient Wisdom and Eastern Mysticism

Selected Ancient Wisdom and Eastern Mysticism, and the Wisdom and traditions of Native American and indigenous people were examined, all sharing a spiritual experience of reality. There was a common thread of the importance of change reflected in many of the Eastern mystical traditions, including the Hermetica, Buddhism, Hinduism, Sufism, Taoism, Confucianism, and the Kabbalah.

Native American people tapped intuitive thought through visions, and they emphasized that by using visioning, one gains wisdom. They stressed the intuitive way of knowing, and had a preference for innermost thoughts over learning through the senses. Ecological awareness and preservation were promoted by spending time in the solitude of nature. Native Americans valued living by example similar to traditions in Hinduism, Buddhism, Zen, and Confucianism, and making sure young people see elders acting in the way of Wakan-Tanka, the Universal Being.

The Ancient Wisdom and Eastern Mystical traditions examined had many differences in specific details, but one important common strand emerged for a concept of spiritual intelligence: the concern for *unity* and the interrelation or *connectedness* of all things and events, with all things being interdependent and inseparable from the cosmic whole, the Creator, and the Creative Force. These common elements

in Ancient Wisdom and Eastern Mystical traditions are similar to the fundamental features of the world view of a conscious universe that emerged from Science. From this examination of Psychology, Science, the Ancient Wisdom and traditions of Eastern Mysticism, the wisdom of Native American traditions, and indigenous people, the following definition of Spiritual Intelligence emerged:

Spiritual Intelligence is the capacity to use a multi-sensory approach including intuition, meditation, and visualization to tap inner knowledge to solve problems of a global nature.

Spiritual Intelligence Components, the Core Capacities, Core Values, and Core Experiences are depicted in Table 2, along with the Key Virtues, the Symbolic System, and Brain States.

Table 2: Spiritual Intelligence Components

Spiritual Intelligence Components
1. Core Capacities: Concern with cosmic/existential issues and the skills of meditating, intuition, and visualization.
2. Core Values: Connectedness, unity of all, compassion, a sense of balance, responsibility, and service.
3. Core Experiences: Awareness of ultimate values and their meaning, peak experiences, feelings of transcendence, and heightened awareness.
4. Key Virtues: Truth, justice, compassion, and caring.
5. Symbolic System: Poetry, music, dance, metaphor, and stories.
6. Brain States: Rapture as described by Persinger (1996) and Ramachandran and Blakeslee (1998).

Developing and Nurturing Spiritual Intelligence in the Classroom

Parker Palmer (1999), in *Evoking the Spirit in Public Education,* stressed the price paid for a system of education that is so fearful of things spiritual that it fails to address the real issues of life, dispensing facts at the expense of meaning, and information at the expense of wisdom. Palmer defined what he called *spiritual* and his definition resonates with the definition Sisk and Torrance (2001) proposed as spiritual intelligence—the quest for connectedness with self, with one another, with the world of history and nature, with the invisible winds of the spirit, and with the mystery of being alive. Palmer said taking just the theme of connectedness, the disciplines of history, physics, psychology, and literature could be taught using connectedness as an organizing theme.

Many teachers and administrators want to address the broader implications of Howard Gardner's (1983, 1999) interpersonal and intrapersonal intelligences and Daniel Goleman's (1995) emotional intelligence. In addition, they want to address the interconnectedness of the learner, the teacher, the local and global communities, with the planet and cosmos that Sisk and Torrance (2001) proposed as the Core Capacity of Spiritual Intelligence.

Charles Suhor (1999) said that the current diversity in schools represents an opportunity to employ traditions and strategies, including writing from the *inner self,* and mindfulness activities (e.g., body scans, Hatha yoga, and meditation). With the growing pluralism in schools, Suhor said there will be greater recognition that spiritually oriented teaching and learning with methods like imaging and meditation are not inherently connected with organized religion, even though some of these techniques may have originated in religious traditions. He recommended including the aesthetic domain, person-to-person contact in discussions on shared experiences, and extrasensory activities such as studying distance healing, telekinesis, and the impact and importance of ceremony and ritual in our lives.

In *Educating for Intelligent Belief or Unbelief,* Nel Noddings (2000) said that if you are going to be a believer, you ought to be an intelligent believer, and to know what it is you accept, and if possible, why you accept it. Noddings said that we cannot shape students as we do pottery. But the establishment and maintenance of caring relations provide a sound framework within which to conduct moral education. She suggested that schools have gardens, plants, aquariums, and animals available to care for, so students can experience and build a strong awareness of nature and their connection with it. This connection-building is particularly important for urban gifted students with little or no experience with plants or animals.

President of the Institute for Global Ethics Rushworth Kidder (2006) reported an Institute activity in *Moral Courage* in which moral exemplars were interviewed from around the world. They surveyed 272 global thinkers in a meeting convened by Mikhail Gorbachev in San Francisco. Core Values were identified and included compassion, honesty, fairness, responsibility, and respect. Kidder said that these ideas are the heart of humanity's search for shared values. He suggested that applying these Core Values will accomplish these goals: 1) Build a common language; 2) Define a common purpose; 3) Develop and maintain trust; 4) Influence the total school climate to enhance the teaching and learning goals; and 5) Provide the basis on which to nurture the spirit, extend the inspirational and holistic vectors, and create a deeper sense of meaningfulness. In their Global Ethics Program, students study moral dilemmas, and use three time-tested principles for evaluating the dilemmas: Ends-based, Rule-based, and Care-based. Ends-based thinking is doing whatever provides the greatest good for the greatest number; Rule-based thinking is principle-based decision making; and Care-based thinking is putting yourself in another person's shoes. The emotional responsiveness of gifted

students makes moral dilemmas a useful teaching strategy to help develop their spiritual intelligence.

Rachael Kessler (1999) developed a program called Passages to integrate heart, spirit, and community with strong academics. Passages addressed six interrelated yearnings, needs, or hungers: 1) Search for meaning and purpose; 2) Longing for silence and solitude; 3) Urge for transcendence; 4) Hunger for joy and delight; and 5) Creative drive and the need for initiation. Kessler found a common thread of deep connectedness in students' work, relating deeply to nature, to their lineage, or to a higher power. In *The Soul of Education,* Kessler (2000) said that if we are educating for wholeness, citizenship, and leadership in a democracy, spiritual development belongs in school. Engaging the spiritual intelligence of gifted students honors their quest to find out what gives life meaning and integrity, what allows them to feel connected, and ways to live a life of service to humanity as suggested by Level 5 of Dabrowski (1967).

Service Learning

Many districts include service learning as an element of gifted programs and of graduation requirements from high school. Service learning provides opportunities for gifted learners to feel more connected to their environment and promotes positive change in both communities and students. The *National Helpers Network* (NHN) provides assistance to school districts in implementing quality service learning programs. They help schools design a plan and establish benchmarks for a program, work with teachers on-site to create and conduct reflection seminars with students, assist in writing curriculum to integrate service into curriculum objectives, and evaluate and document the service learning program.

Service learning helps gifted students make a difference in someone's life and in their community. Gifted students in the Texas Governor's School (TGS) at Lamar University in Beaumont plan, develop, and implement service learning projects during the TGS three-week residential program. The participating students report feeling part of their community and share intentions to perform service in some form for the rest of their lives. TGS gifted students painted murals on inner city buildings, planted shrubs and trees in parks, delivered food to the homeless, and presented a live theater performance of music and dance for seniors in a rehabilitation center.

Earth Force, a service learning program in Alexandria, Virginia with national reach, conducts summer training and planning sessions to help teachers integrate their model into the Science or Social Studies curriculum. *Earth Force* uses a six step process: 1) Take a community environment inventory; 2) Select a problem; 3) Move from researching the problem to investigating the policy environment in which the problem is embedded; 4) Identify options for influencing policy and practice, and look for ways to define a course of action; 5) Plan and take action in the civic arena; and 6) Celebrate completion of the project and experience a period of sober reflection and assessment. Bruce Boston (1999), author of *Their Best Selves,* said that one important result of Earth Force projects is what happens to the students' sense of themselves while they form values that will shape their lives as adult citizens.

Seven Examples of Students Making a Difference Using Spiritual Intelligence

Ryan Hreljac in 1998, as a six year old, was shocked to learn that children in Africa had to walk many miles every day just to fetch water. Ryan decided that he needed to build a well for a village in Africa. By doing household chores and public speaking on clean water issues, Ryan's first well was built in 1999 at the Angolo Primary school in a northern village in Uganda. Ryan's determination led to Ryan's Well Foundation, which has completed 667 projects in 16 countries, bringing access to clean water and sanitation to more than 714,000 people. Currently, Ryan is a college student at the University of King's College in Halifax.

When Rachel Wheeler from Light House Point, Florida was nine, she attended a meeting where a representative of *Food for the Poor* described living conditions in Haiti. Rachel was distressed to learn that children lived in cardboard boxes and ate cookies made of mud to stave off hunger. She began raising money for Haiti immediately, increasing her efforts following the devastating earthquake in 2010. Last year, Rachel used the $250,000 she collected to build 27 homes and a school for a town hit particularly hard by the earthquake. The recipients were so thankful that they named the area *Rachel's Village.*

Charlie Coons at age 13 worked two years to spread world peace one blanket at a time. In 2008, Charlie Coon's older brother volunteered at an orphanage in Jordan, and returned with stories about dirt floors, children who had no shoes, and cold nights. Charlie, age 11 at the time, was so affected by this, she immediately decided to send them fleece blankets, creating one from a kit and inviting friends to make some. Soon, the sixth-graders and other volunteers in her town crafted 50 blankets to ship to Jordan. The orphanage sent a photo of a child with one of the gifts and Charlie said, "Oh my gosh, I made that blanket and now it's helping someone." Still, she was motivated to do more. Her dad Ron, a Rotary Club member, arranged speaking engagements for Charlie so she could raise money for her group which she called HELP (Hope Encouragement Love Peace). Her goal: To send blankets to orphanages around the world. Ambitious, yes, but just a few years later, HELP sent 700 blankets to nine nations with the support of several international children's groups. Her next goal: To establish HELP chapters in all 50 states (Oklahoma, North Carolina, and California are already members). If you want to get your state on board, you can drop Charlie a note at blanketswith-

love@yahoo.com.

Katie Stagliano from South Carolina brought a cabbage seedling home from school as part of a fourth grade plant project in 2008. She carefully tended her cabbage until it grew to a staggering 40 pounds. Realizing her massive plant could provide sustenance to those in need, Katie donated the cabbage to a local soup kitchen where it helped feed 275 people. This experience inspired Katie to start her own non-profit called *Katie's Krops.* Her organization starts and maintains vegetable gardens that donate their harvests to those in need.

After seeing a program on The Oprah Winfrey show in 2007 about children from Ghana sold into slavery for as little as $20, Tyler Page was compelled to take action. Ten year old Tyler grabbed a few friends and organized a car wash that raised enough cash to save five children from a life of servitude. Thrilled, but not entirely satisfied, Tyler asked his mom to help him start Kids Helping Kids, a non-profit which has raised more than $50,000 toward rescuing over 650 child slaves in Ghana. In the past few years, Tyler's Los-Angeles-based foundation has expanded to include a number of other charitable projects spearheaded by local kids.

Two days after the devastating January 2010 earthquake in Haiti, Blare at age l3 saw a little boy crying in a pile of rubble on a newscast. The story brought him to tears. The next day, still thinking about what he'd seen, Blare remembered the teddy bear that always comforted him. "We could start a drive for Haiti," said Blare. At school, his teachers allowed him to announce his plan over the PA system and to ask other students to donate bears. Soon a local TV and radio station became aware of his project, and, through Facebook, other schools joined in. The result? *Blare's Bears for Haiti* sent 25,000 teddy bears to the island nation and about 22,000 more to nonprofits. This year, Blare's group will collect toys and school supplies as well. Blare's advice to others like him is simple: "It doesn't really matter how small or old you are; if you're young and think you can't make a big difference in the world, well, you actually can."

Dylan Mahalingam, at the age of nine, co-founded Lil' MDGs, a non-profit international development and youth empowerment organization. An initiative of Jayme's Fund. Lil' MDGs mission is to leverage the power of the digital media to engage children in the United Nations Millennium Development Goals (MDGs). His organization has mobilized more than 3 million children around the globe to work on a variety of issues, with more than 24,000 regular volunteers from 41 countries. Dylan is a youth speaker for the United Nations as well as a chief strategist and project ambassador for Under the Acacia. The recipient of numerous international and national honors, Dylan is now 15 years old and a sophomore at Pinkerton Academy in New Hampshire.

All seven of these young children manifested Spiritual Intelligence, using their sensitivity to social problems, their compassion, concern for others and inner knowing to solve problems. They were concerned with human suffering and wanted to make a difference.

Educating for spiritual development and higher consciousness represents a hope and goal to provide opportunities for gifted students to develop and use their spiritual intelligence, and to discover what is essential in life, particularly in their own lives. Defining spiritual intelligence as the ability to access inner knowledge, we can see its likely traits and how to strengthen it for learning (Sisk & Torrance, 2001), as illustrated in Table-3.

Table 3: Likely Traits and Ways to Strengthen for Learning

LIKELY TRAITS	WAYS TO STRENGTHEN FOR LEARNING
• Uses inner knowing • Seeks to understand self • Uses metaphor and parables to communicate • Uses intuition • Sensitive to social problems • Sensitive to their purpose in life • Concerned about inequity and injustice • Enjoys big questions • Sense of Gestalt (the big picture) • Wants to make a difference • Capacity to care • Curious about how the world works/functions • Values love, compassion, concern for others • Close to nature • Uses visualization and mental imaging • Reflective, self-observing and self-aware • Seeks balance • Concerned about right conduct • Seeks to understand self • Feels connected with others, the earth, and the universe • Wants to make a difference • Peacemaker • Concerned with human suffering	• Provide time for reflective thinking • Use journal writing • Study lives/works of Spiritual Pathfinders • Use Problem solving • Conduct service learning projects • Use personal growth activities • Use problem-based learning on real problems • Provide time for open-ended discussion • Use mapping to integrate studies/ themes • Develop personal growth activities • Service learning projects • Integrate Science/Social Science • Use affirmations/think-about-thinking • Employ eco-environmental approach • Read stories and myths • Use role playing/sociodrama • Discussion of goal setting activities • Process discussions • Trust intuition and inner voice • Stress unity in studies • Use What, So What, Now What model • Use Negotiation-Conflict Sessions • Study lives of eminent people

Seven Ways to Develop or Raise Spiritual Intelligence

There are a number of ways to develop or strengthen spiritual intelligence, including an emphasis on the Core Values of *community, connectedness,* and *oneness of all, compassion,* a *sense of balance, responsibility,* and *service.* To develop these Core Values, teachers and parents will need to rely not only on the five senses, but on a multi-sensory approach to problem-solving and life, including *visualization, meditation,* and *deep intuition.* With this basic premise, the following, seven ways have been identified to raise or develop spiritual intelligence. They are depicted in Table 4.

Table 4: Seven Ways to Raise or Develop Spiritual Intelligence

Seven Ways to Raise or Develop Spiritual Intelligence
1. Think about your goals, desires, and wants in order to bring your life into perspective and balance, and identify your values;
2. Access your inner processes and use your vision to see your goals, desires, and wants fulfilled, and experience the emotion connected with this fulfillment;
3. Integrate your personal and universal vision, and recognize your connectedness;
4. Take responsibility for your goals, desires, and wants;
5. Develop a sense of community by inviting more people into your life;
6. Focus on love and compassion; and
7. When chance knocks at your door, invite it in, and take advantage of coincidences.

Inherent in the use of these seven ways of developing spiritual intelligence is the need to find a sense of purpose and to create a vision of that purpose. It is equally important for you to ask questions and to believe or trust an answer will be received. Once the vision is created, then you need to commit to it and make an intention to carry through on your identified goal or desire. Shift your locus of authority and perception in life from external to internal and sense the connectedness of everything to everything.

In developing your spiritual intelligence, it is essential to recognize your relationship to the Earth. Earth-centered reverence—focused on a tradition of caring, connectedness, and harmony with nature—was identified in the exploration of Ancient Wisdom and Eastern Mysticism, and in the Wisdom of Native Americans and the traditions of indigenous peoples. In the exploration of Psychology, the need to search for meaning and identity emerged as key elements for individual achievement and fulfillment. In the exploration of the foundation of Science (in quantum Physics), connectedness emerged from a thought experiment verifying that if two particles have been intimately associated and then separated in space, they remain linked nonetheless. This premise of connectedness in Science includes everyone; we are all connected to one another, to the Earth, and to the cosmos.

Infusing Goals, Wants, and Desires with Emotion

In the seven ways to develop or raise Spiritual Intelligence, it is important for the goals, wants, and desires to be fused with emotion. This suggestion is based on findings from Ancient Wisdom and Eastern Mysticism whereby access to unconscious processes was facilitated by attention to feelings, emotions, and inner imagery, as well as the exploration of the foundations of Psychology and of Science. Spiritual Intelligence is not limited in ways that one might expect the mind to be limited. Access to Spiritual Intelligence and identification with its inner knowing can be experienced to an extent that is ultimately unlimited.

Exploring Spiritual Intelligence provides opportunities for students and particularly gifted students with their sensitivity and capacity to find greater wonder and purpose in their lives. Parents and teachers can offer meaningful discussions with their children to honor life's most meaningful questions. These questions include: How can I make a difference? Why am I here? Does my life have a meaning? Discussing these questions will provide gifted children and all children with the much needed motivation and affirmation for them to develop their Spiritual Intelligence and apply it in meaningful problem solving. Too often, gifted children are overwhelmed with an awareness of issues in their community and in the world, and they feel helpless to respond to these problems. A well-developed Spiritual Intelligence can empower children and adults to make a difference. Fools Crow (Native American leader of the Sioux) captured the importance and challenge of Spiritual Intelligence in an interview with Thomas Mails (1990) when he said,

> ***The survival of the world depends upon our sharing what we have and working together; if we don't the whole world will die. First the planet, and next the people.***

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Studies in Psychology: Promoting Awareness of Self and Others to Nurture Spiritual Giftedness

by Kristy Kowalske, Sharon Dole, & Lisa Bloom

In the current climate of high stakes accountability, classroom teachers are often left in a quandary as to how to maintain high test scores and still achieve other classroom goals such as promoting a love for learning, teaching self-regulation, and teaching students to resolve conflicts and live peaceably. Often, nurturing social and emotional well-being falls by the wayside even though researchers (Durlak & Weissberg, 2011) and the public agree that social and emotional learning should be a priority (Bushaw & Lopez, 2013). Areas that have emerged as critical factors related to the well-being and social-emotional success of children and youth include growth mindsets and mindfulness. These work in tandem to nurture students' spiritual intelligence.

Literature Review

Spiritual Intelligence and Giftedness

Sisk and Torrance (2001) provided a theory of the concept of spiritual intelligence with its foundations in psychology, science, and in ancient traditions. In addition, they described eminent individuals or spiritual pathfinders and offered techniques in developing and nurturing the spiritual intelligence in oneself, in young students, and throughout the education system. They defined spiritual intelligence as the capacity to use a multi-sensory approach including intuition, meditation, and visualization to access one's inner knowledge to solve problems of a global nature. Their definition is product-oriented and delves into cosmic and existential issues with awareness of ultimate values and their meanings (see Table 1).

Table 1. Spiritual Intelligence Components

Component	Characteristics
Core Capacities	Concern with cosmic/existential issues and the skills of meditating, intuition, and visualization
Core Values	Connectedness, unity of all, compassion, a sense of balance, responsibility, and service
Core Experiences	Awareness of ultimate values and their meaning, peak experiences, feelings of transcendence, and heightened awareness
Key Virtues	Truth, justice, compassion, and caring
Symbolic system	Poetry, music, dance, metaphor, and stories
Brain States	Rapture as described by Persinger (1996) and Ramachandran and Blakeslee (1998)

Sisk and Torrance (2001) noted a multitude of likely characteristics in spiritually gifted children: uses inner knowing, seeks to understand self, uses metaphors and parables to communicate, uses intuition, shows sensitivity to social problems, is sensitive to purpose in life, is concerned about equity and injustice, enjoys big questions, senses gestalt (big picture), wants to make a difference, has a capacity to care, is curious about how the world works, values love, compassion and concern for others, is close to nature, uses visualization and mental imaging, is reflective, is self-observing and self-aware, seeks balance, is a peacemaker, is concerned with human suffering, seeks to understand self, and feels connected with others, earth and universe.

Teachers' attitudes and philosophies help to guide their decisions about instructional techniques to utilize in the classroom. Sisk and Torrance (2001) described numerous techniques to employ in the classroom in order to promote spiritual growth. By studying spiritual pathfinders and the lives of eminent people, teachers can encourage the capacity to care and to exhibit concern for human suffering. Journal writing and time for reflective thinking aid the development of inner-knowing and understanding of self. Problem solving and problem-based learning promote the use of intuition and concern with inequity and injustice. Open-ended discussions, unity in studies, mapping to integrate studies, and integration of science/social studies allow students to discuss universal issues, experience a sense of gestalt, develop curiosity about

how the world functions, and feel connected with others, the earth, and the universe. Personal growth activities and process discussions encourage sensitivity to the purpose of life, the desire to make a difference, and concern for ethical conduct. Utilizing service learning projects, an eco-environmental approach, and the what/so-what/now-what model promote sensitivity to social problems and a connection to nature. Goal-setting activities, affirmations, and thinking-about-thinking encourage a sense of balance and values of love, compassion, and concern for others. Role playing, socio-drama, and conflict resolution promote reflection, self-awareness, and peacemaking.

Growth Mindset

A mindset is a way of thinking about learning. People with growth mindsets believe that traits such as intelligence and creativity are malleable while people with fixed mindsets believe they are basically unchangeable. In years of research on mindset, Carol Dweck has demonstrated that praising children for intelligence and ability may actually jeopardize their success instead of motivating them (Dweck, 2006). Non-cognitive factors may be even more important than cognitive factors for students' academic performance (Dweck, Walton, & Cohen, 2014). Children and adults who have growth mindsets focus more on learning than measuring performance based on a letter grade or test score. According to the research (e.g., Blackwell, Trzesniewski & Dweck, 2007; Good, Aronson, & Inzlicht , 2003), adolescents who approach learning with a growth mindset are more motivated, more likely to seek and use feedback, and outperform their peers. For African American students, learning about growth mindset can reduce the effects of stereotype threat and increase their valuing of academic work (Aronson, Fried, & Good, 2002). Research has shown that children and youth can be greatly influenced in the mindset they adopt (Dweck, 2006).

Mindfulness

Mindfulness can play an important role in social and emotional well-being. The Mindfulness in Schools project (2015) defines mindfulness as "learning to direct our attention to our experience as it unfolds, moment by moment, with open-minded curiosity and acceptance." It is "the practice of being consciously aware of the present moment" (Burke & Hawkins, 2012, p. 36). Being mindful involves observing, participating, and accepting each moment's experiences from a state of calmness and kindness (Albrecht, Albrecht, & Cohen, 2012).

Researchers have been decrying mindlessness in education for decades; the mindless learning of facts, the stifling of creativity and curiosity, and the nurturing of passivity and superficial rote knowledge (Csikszentmihalyi, 1996; Gardner, 1991; Langer, 1997; Langer & Moldoveanu, 2000; Robinson, 2001; Silberman, 1970). The research on mindfulness in education suggests that it can be taught and learning can become a more mindful experience (Broderick, Kabat-Zinn, & Kabat-Zinn, 2013; Burke & Hawkins, 2012; Gould, Dariotis, Mendelson, & Greenberg, 2012; Manuel, 2015; Ritchhart & Perkins, 2000). In her examination of 20 quality studies on mindfulness with youth, Weare (2013) found that when it is taught well and practiced regularly, it can be effective in improving self-esteem, self-regulation, positive behavior, and academic learning. Manuel lists the following benefits of mindfulness for children: (1) It builds resilience, (2) It supports social development, (3) It increases happiness, (4) It builds successful relationships, (5) It increases compassion towards others, and (6) It enables children to be aware of their emotions prior to reacting, resulting in better choices (2015). According to Schonert-Reichl and Lawlor (2010), introducing mindfulness skills early in life can promote social and emotional well-being and prevent the development of unhealthy behaviors. By practicing mindfulness techniques, students and teachers can reduce anxiety and stress.

Social and Emotional Issues

Schools are increasingly being viewed as providers of a holistic education and, therefore, effective settings to address social-emotional learning (SEL) (Lendrum, Humphrey, & Wigelsworth, 2013). Social-emotional problem solving not only reduces disruptive behavior and school failure but fosters social competence (Blair & Diamond, 2008). In addition, SEL can help reduce the achievement gap between advantaged and disadvantaged youth by the development of social competencies such as peer cooperation and social problem solving. In their review of the research on the social and emotional development of gifted students, Neihart, Reis, Robinson, and Moon (2002) found that, although gifted students are as well adjusted as other groups of students, they face situations that may make them at-risk for social and emotional problems. These include asynchronous development as the result of their high intellectual capacity; the psychological responses of underachievement and perfectionism often associated with giftedness; being creatively gifted or being gifted with a disability such as Attention Deficit Hyperactivity Disorder (ADHD), Asperger's Syndrome, or a learning disability. A social emotional curriculum approach is one approach that has been found useful for supporting the social and emotional development of gifted students (Neihart et al., 2002; Reis & Renzulli, 2004). Unfortunately, with the current emphasis on high stakes assessment of academic achievement, the general research base on SEL is not as well developed as it is with academics (Stoiber, 2011).

Purpose of the Study

This study sought to analyze a unit of study created to teach growth mindset, mindfulness, and awareness of social and emotional issues. Students in two classes of sixth grade honors language arts completed the study. The overall focus of this unit was to nurture spiritual intelligence. One of the main objectives was to have students evaluate their perceptions about performance and success in order to help establish a foundation of resilience, grit, and perseverance, encouraging a growth mindset. By studying mindfulness, we hoped to help create opportunities for the students to process emotions and thought patterns. By exploring social and emotional topics, we hoped to promote a deeper understanding of self as well as others.

Method

We designed a qualitative case study to assess this unit of study. The unit of study included the following components: a week-long study of growth mindset and mindfulness using picture books, videos, and a session presented by the guidance counselor and two weeks to research social and emotional issues (resilience, underachievement, anxiety, excessive worry, twice exceptional gifted students, depression, bipolar disorder, poverty, gender issues, minority issues, behavior disorder, Oppositional Defiance Disorder, perfectionism, fear of failure, fear of success, low self-efficacy, Attention Deficit Hyperactivity Disorder [ADHD], high creativity, multiple intelligences, emotional intelligence, spiritual intelligence, introversion/extraversion, Obsessive Compulsive Disorder, overexcitablities, Theory of Positive Disintegration, Autism Spectrum Disorder, and Imposter Syndrome). After researching the social and emotional issues, students gave presentations about their topics. Presentations included details about the issues, a skit about the problems and possible solutions, and a guidance counselor-type activity to help students understand the topics. After watching all of the presentations, students wrote a poem for the school-wide Poetry Slam and a self-selected piece of writing which could be a series of poems, a short story, a memoir, a picture book, an essay, an advice column, or a brochure.

After determining the goals for this unit of study, we applied for two grants to receive funding to purchase materials. Through the grants, we received 15 picture books about growth mindset and mindfulness, and 22 books about social and emotional issues. In addition, we received three classroom sets of nonfiction books focusing on growth mindset and perseverance in order to extend this type of investigation in 7th and 8th grades.

We collected data through a pre/post test assessment, journal entries, students' reviews of the unit, focus groups, analysis of presentations the students gave, and the writing assignments they turned in at the end of the study. The pre/post assessment provided information about students' self-perception of mindsets, mindfulness, perfectionism, underachievement, stress and anxiety, fear of failure, depression, organizational skills, and peer pressure. The pre-assessment gave insights into areas where students struggled and the post-assessment allowed us to see if the students had learned strategies to help with issues they were facing.

Throughout the unit of study, students wrote journal entries about their reactions to what they had studied. At the end of the unit, students described what they had learned and shared information about personal experiences or experiences of family members. The focus groups consisted of three groups of six to eight students who discussed the unit of study for 25 minutes during their lunchtime. We derived our themes by analyzing the students' journals, their writing samples, their descriptions of what they had learned throughout the unit of study, and through the focus groups. Next, we recorded poignant quotes and organized these quotes by the two main themes that emerged: students' understanding of self and students' understanding of others.

Participants

We conducted this unit of study in a rural Southeastern town with two sixth grade honors language arts classes consisting of 57 students. For placement in these classes, students had to show high performance on standardized tests, teacher recommendations, grades, and an aptitude test. Among the students in this class are two identified with Attention Deficit Disorder (ADD), and another diagnosed with both ADD and high-functioning Autism Spectrum Disorder. Although not officially diagnosed, several students have discussed problems with anxiety, excessive worry, perfectionistic tendencies, and underachievement.

Results

Students offered many revealing thoughts throughout their presentations and in their writing samples, end-of-unit assessments, and focus groups. Some of the thoughts were broad in nature, assessing the overall unit of study, while others mentioned specific topics. Two main themes emerged: 1) students' understanding of self, and 2) students' understanding of others.

Understanding of Self

Several topics emerged over and over again in the students' descriptions of what they learned in this unit of study and in the poetry they created. These topics included the following: mindfulness, growth mindset, resilience, imposter syndrome, excessive worry, perfectionism, and anxiety.

Mindfulness. Students described their understanding of mindfulness and the potential benefits from practicing mindfulness in their daily lives. One student explained, "Mindfulness is when you focus on one particular thing. It could be a butterfly, the grass tickling your ankles, or the smell

of hamburgers on the grill. All these things are examples of mindfulness and things you could practice every day."

Another student described mindfulness as "enjoying the moment and taking the time to stop and enjoy the warm breeze or enjoying the sweet crisp taste of an apple."

Another shared, "Mindfulness is about not thinking what class you have next but enjoying the present. Instead of thinking about lunch or what class we have next, I will listen. When we're eating dinner, instead of eating really fast, I am going to enjoy being with my family. When I'm sitting still doing something, I will focus on the something."

A student described a quote she found during the research process. She shared, "My favorite quote I found during this project was, 'Think that you're in the future looking back on today, would you have made that choice? You know that if yesterday is the past, now must be the future.' I forgot who it's by, but it reminds me of how I should live, in the present."

Another shared, "Throughout these activities I have learned so much, but I also made some connections with some of the books. The book *What Does it Mean to be Present?* is one of the books I made connections with like not worrying about the past or the future. Many other books gave me ideas and suggestions on how to look at things differently that I am using in life. I love doing these projects."

For the poetry slam, a young lady presented the following poem:

"Experience"

Look around you
Smell the green grass
Breathe the soft breeze
Experience this moment.
No worries
Everything is okay
Nobody knows what tomorrow brings!
So calm down and see
Listen to the wind
Concentrate on the sky
See how blue it is?
See how peaceful?

Take it all in
Piece by piece
Live, laugh, love
Experience this moment.

Growth Mindset. Students described how important it was to have a growth mindset as opposed to a fixed mindset. One described, "Whenever I get a bad grade, I've learned to accept it and move on. I know I will do better next time. You can never get rid of your knowledge!" Another described how reading one of the picture books about growth mindset impacted her:

> I think the most important thing I learned was that it's okay to fail. *The Rosie Revere, Engineer* book impacted me greatly. I have a huge fear of failure, and the thought of me embarrassing myself in front of people terrifies me (that's why I hate presenting). In *Rosie Revere, Engineer,* Rosie shared my fear of failure. However, she overcomes this fear when someone tells her that it's okay to mess up, and that Rosie actually did pretty good. But, obviously, that's not how life works. I mean, even if everyone tells me "It's okay you stuttered in your presentation," I wouldn't really believe them. I guess that's partly me being a perfectionist, but instead of trying to make perfect circles I'm trying to make myself perfect. However, deep down, I know it's okay to mess up.

One student chose to address the topic through a poem:

"Growth Mindset"

Failure
Helps me learn
From mistakes
No discouragement
I will help my mind
Learn and grow

Resilience. Several students chose to write about resilience for their final products. One girl wrote the following 3 line poem:

"Resilience"

I take careful steps
Having the ability,
To bounce back at times.

Another wrote:

Resilience
Happiness, joy, carefree
No worries, positive feelings
Bouncing back from the bad
Lifted spirits
I am resilient

Imposter Syndrome. Several students described being able to connect to experiences of not feeling adequate. One girl shared,

> Another thing that really impacted me was the Imposter Syndrome, which I can also relate to greatly. I mean, what honors kid doesn't ask themselves "Am I really that smart?" when they don't do good on a test?

Another student shared this poem:

"Imposter Syndrome"

People say I'm great
I succeed at what I do
But deep inside I know what's true
They are wrong
I'm a failure, a fraud, a fake
I'm a deceiving slithering snake
No one sees me how I truly am.

Excessive Worry. Numerous students wrote about excessive worry as an important topic in this unit of study. One student shared, "Sometimes I just think about everything that could happen. Sometimes I scare myself. But now I know strategies I'm going to use."

Another student wrote,

> I also realized I have excessive worry sometimes. I find myself making up crazy scenarios that will never happen. I worry about everyone and everything. Sometimes I can't sleep at night or I find myself not focusing in class. I have this one really good friend that I am able to tell everything to. He gives me really good advice and can always take my mind off things.

For a final product, one student created a picture book about worry taking the form of a monster. The following is an excerpt from the picture book:

> When Karly left school that day, she didn't realize someone was following her. A tiny little blob was following her, it was called a STRESS MONSTER. He followed her everywhere she went. And every time Karly thought about everything she had to do, she got stressed…. And the Stress Monster got bigger.

Perfectionism. Many students connected with the topic of perfectionism. One student shared, "I have struggled with perfectionism because I would be so afraid I was going to do something wrong, I would procrastinate on projects and not finish them." Another student shared, "Sometimes I also have issues with perfectionism. I have never had a B or below on a mid-term or report card."

Another shared,

> I worry about all of the projects and a few of the assignments that I am given. I worry about how I will complete them and I worry about what score I will make mainly with social studies and language arts. I'm a bit of a perfectionist. I want to make all A's.

One girl wrote the following poem about her fear of failure:

"Weeds"

There are many weeds in my garden of courage.
Weeds that seep under the ground and grow quietly,
Until one day they burst toward the sky and suck the life out of my flowers.

There are many weeds in my garden of courage.
Weeds that represent all of my fears.
Fears of clowns, heights, and bad grades,
Fears of storms, failure, and planes.

These weeds grow up and blitz me from behind.
Making me second guess myself,
I wonder why I even try,
If I'm just going to awaken new fears, and disturb fears that I have tried to forget.
Then what's the point if it will all end the same way.
In my worst fear of all,
FAILURE.

There are many weeds in my garden of courage,
Weeds that seep under the ground grow quietly,
Until one day my once beautiful garden of courage has become an ugly place.
A place not even I want to be seen.
But if you look real close you can see, a single flower in a sea of green.
That single flower is all that's left of me.
That single flower is all I used to be.

I lost my garden of courage to the weeds of fear.
But because I lost my garden of courage it is even more important to save yours.
To save your garden of courage from the reign of fear and protect your garden from anything like mine.
So wake up early each morning and cleanse your garden of courage,
Until there is no more fear.
Instead you will see a garden full of everything you could ever dream.

This garden is all you have and all you are.
This garden is what will keep you safe and protect you from the terrifying world of fear.

Anxiety. One boy expressed interested in learning more about anxiety in his second journal entry. He shared, "I have learned a lot about growth mindset/ fixed mindset and depression so far, and I hope to learn more about the other topics, especially anxiety, because I get nervous about almost everything." For the final writing project, a student wrote a picture book about anxiety. She wrote:

> It was just an ordinary school day when *it* happened. I couldn't tell when *it* was coming, but I knew *it* would. Like I said I had them before, but not like today, no, today was different. All of a sudden my mind was a **HORRIBLE** storm filled with tornados, hurricanes, earthquakes, and darkness. I had a million things spinning around in my head. *What's going on? Why is this happening to me? Isn't that project due tomorrow? I have so much homework. Don't I have softball tonight? Why is my heart beating so fast? I'm feeling light-headed. I think I might pass out. UGGHH, why is my life so messed up?*

Understanding of Others

Students expressed a deeper understanding of issues other people face. For some, it was in the challenges that make life difficult. Others were able to make connections with family members. Students also described how individuality should be celebrated and described topics they would like to study in the future.

Facing Challenges. One student made a list of 25 facts she had learned during the study. Among her facts were:

> When you have a fixed mindset, you can or can't.
>
> Behavior disorder can get in the way of things.
>
> Existentialism is when people worry a lot about others.
>
> Some girls try to hide their intelligence.
>
> Underachievement sometimes has more to the story.

Many student expressed a deeper understanding of challenges associated with specific social and emotional issues. One student shared,

> I learned that some conditions/abilities are more serious than I first thought. For example, I learned that people with OCD find it extremely necessary for things to be a certain way. People with anxiety aren't just really nervous, they actually have serious breakdowns about certain things. I also learned cures for the conditions. No matter what traits people have we will all have one thing in common. We are all human. Imperfect.

Making Connections. Students also made personal connections with fellow classmates and relatives. One boy described his aunt's work:

> I learned more about autism which helped me understand my aunt when she talks about autistic people. My aunt works at St. Jerad House which is a school for kids with autism. She is always talking about how she loves working there and all about all those different kids. This helped me understand her a whole lot better because of the details that Tia and Annabelle shared in their presentation. I learned why autistic people learn differently and why they do things that sometimes we don't understand.

Another boy described having a stronger understanding of his sister's issues associated with Autism Spectrum Disorder, formerly referred to as Asperger's Syndrome. He shared:

> I learned about autism. My sister has Asperger's Syndrome. I think that is a mild version of autism, but I'm not sure. She gets annoyed easily and some of it is because of me. If she doesn't take her medicine then she gets really crabby and argues a lot the whole day. She is 16 and is in 10th grade. I think she is an introvert or that it is because of the Asperger's.

Two topics that were quite popular in this study were OCD and Oppositional Defiant Disorder. The following are two short poems written about those topics:

"OCD"

OCD, it's true.
You can be quite obsessive,
Now straighten the desks!

"Anger"

Frustration, Anger
Foggy Mind, Blurred Sight, Anger.
Deep Breaths, Deep Breaths, Calm.

As the unit progressed, one girl asked if she could add a third topic to her research because her sister struggled with issues at home. At the end of the unit, she wrote:

> I learned that life is full of mistakes! It's okay to make one! I also am now more understanding with my little sister. She has Sensory Processing Disorder and from my research I know how to deal with and help her. I think that I not only became more present through this unit of study, but I also became a better big sister.

One boy described how both his father and sister struggle with excessive worry. After the unit of study he felt he could help them when they were having problems. He wrote,

> The most important thing I learned in this unit of study is how to help people in my family. With what I have learned like ways to stop worrying. I can help my dad and sister to not 'sweat the small stuff.' With the skit about the topic, I can tell and show them ways to take their minds off of things.

Celebrating Individuality. One student expressed how important it is to accept yourself and celebrate who you are as an individual regardless of issues you may face. She shared,

> I think the most important thing about this unit of study is that people are different. They come from all different walks of life, so don't judge them for who they are, be proud of who they are! There is nothing that you can do better than being yourself! So, just be yourself and don't let others tell you who to be. Be you! If you let others tell you who to be, then you feel out of place. That's not the way it's supposed to be! You are the best you that you can be, so be proud of yourself and who you are as an individual.

Further Studies. Several students described having a new awareness about the world around them as a result of this unit of study. One student shared, "I respect people's feelings more through this project. It helps me understand my own feelings better than I thought I ever could. This project really helps me look around and observe the world." For a journal entry, another student wrote,

> I love this unit of study because of the great topics my partner and I got to work with. I like studying how OCD works and how people who have it think and react differently to things. I don't know why I am interested in it, because before this unit, I didn't truly understand any of this. I really like this unit and hope to do something like it again.

A girl who presented about underachievement concluded her final assessment by asking a few questions. She wrote:

> I also have a few questions:
>
> 1. Why do adults not think like children?
>
> 2. Why do children want to know everything?
>
> 3. Why do people in general feel that the only way to be, is to be correct?

The unit prompted interest in topics about psychology, spurring interest in studying these topics in the future. One student shared,

> I want to study more about the brain and its function. I am very fascinated with how we function. I want to learn about how much we use and the possibilities that we could explore if we unlocked our full brain power.

Discussion

Through studying mindfulness, students expressed how paying attention to their five senses allowed them to remain in the moment and be present. These techniques allow students to connect to their surroundings, providing the opportunity to nurture spiritual giftedness as students develop inner knowing or intuition, understand how to achieve inner balance, become closer to nature, and feel connected to the earth (Manuel, 2015; Sisk & Torrance, 2001).

As students described their understanding of growth mindset, they expressed a desire to continue to learn and grow in the face of challenges. By understanding personal dispositions students were able to think about personal motivations and better understand themselves, traits found in spiritually gifted individuals (Sisk & Torrance, 2001). Many students described issues with perfectionism, excessive worry, anxiety, and Imposter Syndrome, issues that affect gifted students and may be associated with fixed mindsets.

Researching the social and emotional topics allowed students to discuss universal issues, develop curiosity about how the world functions, feel connected with others, understand how the world works, and become more reflective, self-observing, and self-aware. These qualities are noted to enable students to be spiritually gifted (Sisk & Torrance, 2001). By writing picture books, short stories, memoirs and poetry, students were encouraged to explore metaphors and parables to communicate, demonstrate sensitivity to social problems, and further develop concerns with human suffering, qualities found in spiritually gifted individuals (Sisk & Torrance, 2001). As a result of the study, the school plans to provide mindfulness training school-wide through monthly guidance activities and individual teachers' implementation in order to provide an avenue for growth in resilience, social development, self-awareness, compassion, and management of stress and anxiety (Manuel, 2015; Schonert-Reichl 2010).

Conclusion

Addressing non-cognitive factors in the classroom is essential for the overall goal of helping students become happy, productive adults able to take care of themselves, their families, and others. By providing explicit information about how the mind works, students can reflect on personal beliefs and experiences. By focusing on these topics, students gained a deeper understanding of self and others, providing an avenue for nurturing spiritual giftedness.

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A Glimpse Into My Clinic: The "Associations Game" As Part of a Dynamic Diagnosis

by Hanna David

Introduction

The "Associations Game" is one of the many activities I have either invented or adopted—sometimes with changes—in order to upgrade my understanding of the child who seeks treatment. In spite of the fact that almost all children I meet are gifted, many of them are not diagnosed as such. The reasons for that are many:

- Their age. While the minimal age of children who start treatment with me is five, very few children under the age of eight are assessed for gifted education in Israel, as only in grade two or three are children eligible for free identification as gifted students by the Ministry of Education;

- Even children who have gone through the process of full diagnosis—usually because of social, emotional, or familial problems in kindergarten or in the first years of school—almost never get the "gifted" label because of lack of knowledge in deciphering the results of the diagnosis (David, 2014a);

- Many gifted children—some are highly gifted—do not "pass" the Ministry of Education giftedness test administrated by the Szold Institute (David, 2012);

- In Israel there is neither identification process nor any support for children gifted in non-cognitive areas. This includes sports, arts, music, and so forth. As a result, I meet children who have been defined as "non-gifted" after failing the identification process by the Ministry of Education, while being Israeli champions in dancing, martial arts, or singing, as well as adolescent concert players who perform in dozens of countries.

- Many gifted children, especially very young ones, have difficulties cooperating with the examiner and thus the results of their examinations do not reflect their high abilities (David, 2014a).

Thus, it is of special importance that I get as much information about the child who comes to me for help, and that will be done during playing, sculpturing, drawing, cutting and pasting, etc. In many cases I choose activities the child is already familiar with, but quite often gifted children enjoy doing something they have never done before and have no opportunity to do elsewhere. One example of such activities is the Associations Game, a simple game I have invented. It has but three rules:

1. I always start – I write down the word "mother."

2. After "mother" is written, the child writes whatever comes into his or her mind. Then it is my turn to write whatever comes first into my mind, and so on.

3. The game ends when I decide to end it. This depends on the child's age and willingness to go on. When a child is losing his or her patience, I think of a word that will be associated with "mother." Until now, I have always managed to do it with a maximum of three words.

This work intends to shows how much there is to learn from "playing" this game with four children ages five to ten. These children are a subgroup of the "collection" I have gathered during the last few years: children of different ages; those from secular as well as one from a religious background; those who are very sensitive, creative, and communicative, and one who was not. All the cases presented are of boys. Though a few adolescent females have gone through long interventions with me during the last five years, only two young girls have. Neither of them was gifted according to Israeli criteria: one had serious communication problems and the other was artistically gifted. One of the main aims of the Associations Game is estimating the creativity level of individual children in order to help them develop it and thus realize their potential. Hence, this preliminary stage of using this tool to present my findings does not apply to cases where there are additional severe disabilities or problems or when children have already proven to be artistically gifted, namely they show exceptional creativity in dancing, sculpturing, painting and the like.

In two of the cases, the child and I played the Associations Game twice. Due to space limitations, I have chosen to present only one of these cases. I have not presented the second game of Ben, the 5:7-year-old boy, but have explored both games by Guy, the 10:4-year-old boy who played for the second time just five months later.

The Associations Game – Five Games of Four Boys

1. Adam, aged 5:1
[=5 years one month], a few weeks after we met for the first time

Mother – kiss – ***sweet*** – father – ***sport*** – yelling – ***ears*** – eardrum – ***drums*** – door – ***please open*** [mother is coming]

The ***red*** associations are [always] mine.

This example is very short, as the child was only 5 when we played. In addition to the age limitation, this child looked much younger than his chronological age: both his height and weight were consistent with percentile 50 of a three-year old boy. However, I was the one who decided to end the game. After Adam wrote "drums" he said to me: "I am a little tired, maybe from now on I'll say the words and you will write for me?" Right away I decided to close the circle and wrote: "***please open***," assuring him there was another game waiting for him, and hoping we would have another opportunity, when he grows up a little, to play the Associations Game again.

Here are some insights from the game.

The Associations Game speaks for itself. Adam was very happy when I wrote "***mother.***" Without thinking for a moment he wrote "kisses," smiling. Knowing that his father was doing a lot of sports, I wrote "***sport***" after "father" (in Hebrew the word "sport" has no plural form), to which he responded by "yelling." I chose to put in "***ears***" in order to give Adam *carte blanche* to add anything he wanted about his father, thinking that as "ears" had neither good nor bad connotations it would help Adam continue his flow of thoughts. And indeed, Adam's next association, eardrum, was still connected to the noise his father used to make when yelling. In Hebrew "ears" and "eardrum" do not share syllables or sounds; the transcription of "ears" is "Oznayyin" and that of "eardrum" is "Or Ha'Tof" [literally translated as, "the skin of the drum"]. So, by writing "eardrum" Adam showed both his distress and his creativity. When I wrote "drums" I showed Adam that I remembered what he had told me—that he liked playing the drums more than anything else. Adam's "door" was symbolizing the fact that even when the door was closed he could not play the drums as much as he wanted because of the noise!

This quite short game has taught me a lot about Adam, especially about his creativity level and his family relations. At this early stage of the interventions I could not open the issue of "mother versus father" and the way Adam perceived his father, but I learned a lot about the direction the intervention had to take in order to be more successful.

2. Ben, Age 5:7, started meeting me seven months earlier

Mother – watermelon – ***sweet*** – salty – ***pretzel sticks*** – banana – ***sweet*** – key (of a piano, organ) – ***accordion*** – eye – ***green*** – poison – ***bad*** – this – ***nonsense*** – eyebrow-***twisted*** – alone – ***chicken leg*** – runny nose – ***disgusting*** – flowers – ***turquoise*** – computer – ***immobile*** – laughs – ***children*** – adults – ***bent*** – old – ***wheel-chair*** – seaman – ***dragon*** – Ladon – ***orange*** – apple – ***honey*** – Rosh Hashana [the Jewish New Year] – ***Shofar***[1] – synagogue – ***choi-*** Rishon Leziyon – ***concert*** – death – ***bouquet*** – skin – ***tan*** – sun – ***sweating*** – summer – ***swimming*** – Omri [the sixth king of Israel after Jeroboam, 9th century BC] – ***King*** – Tuviyahu [a very popular television program]– ***wealth*** – good – ***vacation abroad*** – view – ***panorama*** – sky – ***stars*** – moon – ***facial expression*** – happy – ***family*** – noise – ***headache*** – rabies – ***illness*** – hospital – ***medication smell*** – iron [as in medication, given usually in cases of lack of hemoglobin] – ***blood*** – man – ***child*** – real – ***mathematics*** – Vladimir [the first name of the known math teacher, Dr. Vladimir Radizolonsky] – ***Russia*** – Lia – **Iris [his mother's sister; Lia – her daughter]**

I started, as usual, with "mother" and ended with "Iris," the name of Ben's mother's sister. In Ben's case, in spite of being so very young, I ended the game after he filled a whole sheet of paper; I closed the circle by connecting "mother" to the name of her sister.

I wrote "orange" after Ben's "Ladon" as a trial to move him away from his associations field. I was not fully successful immediately. He wrote: "apple," but when I wrote "honey" (apple with honey is one of the traditional dishes in the celebration of the beginning of the Jewish year) Ben "neglected" the mythological world in order to participate in the Jewish one. We played the Associations Game in the week of the Jewish New Year, Rosh HaShana, "head of the year," and Ben seemed to be happy to switch from one world to the other easily. However, this easy-going kid taught me at that point that I should be as attentive as possible to his wishes and desires. Unlike most gifted children, whose emotional age is less than their cognitive (e.g. Bailey, 2011; Landau, 1992), being so mature emotionally put Ben at risk of giving up easily, especially to adults, but also to peers. As was obvious in the next years, he understood—maybe too well—that giving up was much easier than arguing, and that if somebody made a mistake it was much more convenient to let her or him think they were right than insist on getting his rights, hearing his truth, and having his needs fulfilled.

Ben's association of "choir" was "Rishon Leziyon," my hometown. This is explained by the fact that Ben had a season ticket for children's concerts in the culture hall of Rishon Leziyon (though he did not live there).

Choosing "Tuviyahu" (a very popular TV program starring Tuviya Tzafir, one of the most famous Israeli child stars) as the association for "king" shows clearly that a very gifted child who is highly creative and very well emotionally developed still enjoys funny

[1]A musical instrument of ancient origin, made of a horn, traditionally that of a ram, is used for Jewish religious purposes; Orthodox Jews consider hearing it on Rosh HaShana as compulsory.

TV characters just like other children his age.

We "played" with vocalic alliterations in two cases: when he suggested "poison," which is "**Ra'**al" in Hebrew, I suggested "bad" ("**Ra**"); the second time, when I suggested "vacation abroad" ("**Nof**esh [Be'Chul]), he suggested "view" ("**Nof**").

When Ben wrote "Ladon" after my "***dragon***" ("Drakon" in Hebrew), it was a much more impressive alliteration, as Ladon was a serpent-like dragon. Without getting into the question of how a 5:7-year-old Israeli boy even knows about Ladon, I found his ability to use the specific word with both the same associations word AND a similar sound quite remarkable.

I did not correct Ben when he switched the consonant "gimel" with "zayin" (in the word "eyebrow" ["gaba" in Hebrew]). In Hebrew handwriting (usually taught at the end of grade one, not at age 5:7), these two letters differ from each other by the direction of the half-circle added to the straight line they both share. My experience proves that at such a tender age—no matter how gifted the child is—corrections related to mirror-writing (see, for example, Cornell, 1985; Cubelli, & Della Sala, 2009) should by no means be avoided.

Ben made a similar spelling mistake that I did not correct either: he wrote "Percy Jackson" using "zayin" instead of "gimel." However, as the Hebrew transcription of "J" is produced either by a "gimel" or by "zayin" with an apostrophe, the fact that Ben used one of those possibilities (the apostrophe after the "zayin") was quite impressive, and I felt it was much too early for explaining the formal differentiation between these two similar consonants that do not even exist in Hebrew.

When Ben suggested "eye," I immediately wrote "green," the color of my eyes. While usually I minimize speaking about myself during the meetings, I have realized that each time I did speak, it helped the child. In this case, maybe because in Israel green eyes are quite rare, Ben not only remembered this fact but mentioned it many times afterwards.

During the whole session, I never "went easy" with the vocabulary I used, thinking, "this is a five-year old boy." During the Associations Game playing, Ben understood all but one word I wrote, "immobile," used as an adjective describing a single computer (in Hebrew both adjectives and adverbs have either the singular or the plural form). He asked me, "what is it?" and I answered. As the Hebrew word for "immobile" is "Nayach," and its root is חוג (pronounced "nooch," meaning "resting"), he said immediately: "the computer is resting, it does not go from one place to the other." which is the exact explanation.

In spite of the fact that I told Ben that he could use "ugly," "insulting" words and even curses, he showed no inclination to do that, so I tried to put in as many of such words as I could—for example, "twisted" or "disgusting." Finally, Ben joined me. His association with "family" was "noise." Knowing that I was fully aware of how much he loved his family and cared for each member of it made it possible for him to open up and admit that because there were many people, it could sometimes become very noisy. Noise was, and has been for Ben, one of the main sources of suffering throughout his childhood.

The only "pure" spelling mistake Ben had made was use "Kof" instead of "Kaf." In Hebrew, there are two different consonants (ק vs. כ) which sound the same. Ben made this mistake in the word "synagogue" (*Beit Knesset*), but I did not correct him as I suspected he had not seen this word yet and knew that he was sure to remember its spelling when he did.

"Omri," the common Israeli name Ben suggested, was the name of an evil Biblical king. "Omri did evil in the eyes of the Lord, and did worse than all who were before him. For he walked in all the ways of Jeroboam the son of Nebat, and in his sin by which he had made Israel sin, provoking the Lord God of Israel to anger with their idols" (Kings 1, 16, 25-26)[2]. Ben did not even know that Omri was an Israeli King. Since expanding the world for those who express interest in any subject is what I have been doing since I started intervention processes with gifted children, I immediately showed Ben the relevant verses. Opening a window to the world of biblical figures was not what I planned to do with Ben; I did that because he was interested in it and I knew once he learned anything, he would never forget it.

When Ben wrote "death," it was ok with me (on children interested in death see, for example, David, 2015), but I somehow felt it was better to "move away" from this subject, and without thinking I wrote "flowers" in order to change the semantic field of death, sadness, and tragedy, to that of life, happiness, and beauty. Though Ben and I did not formulate the rule, "one cannot use the same word twice," this rule was clear to Ben and he instinctively responded, "we already used 'flowers'". I answered: "you are right" and wrote "bouquet" instead. This was my way of rephrasing "flowers," something alive and colorful.

In summary, at the tender age of 5:7, Ben showed a very high level of cognitive ability, persistence, and a range of interest. All these characteristics helped him develop his creativity, which could already be obvious in writing. In the next few years, Ben had developed a similar level of creativity in English writing as well, along with many other cognitive and artistic areas.

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[2] The tendency of "modern" Israelis to give their children names of biblical characters described as bad, negative, sinning, is hard to explain; this interesting phenomenon is beyond the scope of this article.

3. Eli, Age 9:9, just started meeting me

The case of Eli is of high importance as it gives us a hint to an additional function of the Associations Game: predicting the length and the success of the treatment. The game with Eli was exceptionally short for a boy his age with a measured IQ of 154 and no learning disability. Here it is:

Mother – son – ***cute*** – sweet – ***chocolate*** – candies – ***stick*** – tofu – ***marmalade*** – paleta – ***sticky*** – glue – ***transparent*** – opaque – ***war*** – guns – ***soldiers*** – tanks – ***wounded*** – hospital – ***infusion***

Let us analyze it.

The immediate association of "son" after "my" "***mother***" was expected[3], but did not predict either a high or a low level of creativity. However, right after I suggested "***cute***," and throughout the whole game, I did my best to trigger Eli, to push him, even to tease him, but failed. His response to "cute" was sweet; I moved from these two adjectives to "***chocolate***," knowing he loved eating it, and he responded with "candies"—more of the same kind. When I wrote "***stick***"—referring to lollipop, which in Hebrew is literally "a candy on a stick"—he contributed "toffee", another sweet, popular candy. I wrote "***marmalade***" in order to help him move towards other tasty foods, not necessarily sweets, but he insisted on remaining in the same semantic field and wrote: "paleta". When I wrote "***sticky***" he responded with "glue," which in Hebrew has the same root as sticky: D.V.K (they are pronounced: "*davik*" and "*devek*"). I wrote "transparent" and he contributed "opaque," the opposite of transparent. At this point I felt I had to use more drastic means in order to help Eli move from his poor associations field, and thus, as the Hebrew word for ""opaque" is pronounced "Atum" and as it is written exactly like "Atom" I suggested "***war***." As it happened, this did not help the game: Eli wrote "guns." I tried "***soldiers***," thinking that he might think about people he knew, but he responded with "tanks," going back to the semantic field of war but excluding people. Only when I wrote "***wounded***"—actually went back from Eli's tanks to my "***soldiers***"— did he write "hospital." But when I wrote "***infusion***," he told me he had enough and we stopped without the closure I have managed to do even with 5-year olds.

In summary, the very short work of this highly gifted child, and the fact that he perceived the game as a task rather than as an enjoyable way of "playing with words" was a bad sign. Eli left the treatment a short time after we started it; his parents explained to me that "he was tired and needed a rest during the summer holiday, and will be back at the beginning of the school year." As I had expected, this never happened. Eli joined the statistics of the majority of Israeli children identified as gifted who "gave up their giftedness" (see, for example, David, 2014c).

4. Guy, age 10:4, started meeting me 3 weeks before

Mother – mine – ***article*** – saying – ***something*** – beast – ***steak*** – Ugh – ***stepping on dog's droppings*** – dogs – ***barking*** – WÜF [4] – ***nerves*** [5] – sunshine [6] – ***fireworks*** – excitement – ***winning*** – cup – ***gold*** – eighty – ***Mendeleev [Dmitri Ivanovich]*** – elements – ***building*** – collapse – ***compensation*** – $ – ***Liberty statue*** – the Greek Gulf – ***Hanukkah*** [8] – ש.ה.ג.נ. – ***doughnut*** [9] – jam – ***glue*** – scissors – ***[for] left-handed*** – right-left [10] – ***army*** – fire – ***bonfire*** – Lag Ba'Omer[11] – ***potatoes*** – black – ***coal*** – kerosene – ***oven*** – Lazania – ***Supermarket*** – sweets – ***dentist*** – holes – ***patch*** – Shoah – ***independence day*** – [the local] municipality – ***repairing the road*** – collapse – ***saving*** – firemen – ***psychologists***

As we can see, Guy was verbally rich, highly knowledgeable, and blessed with a creative flood of ideas as well as a good sense of humor. In spite of the fact that he had first met me only three weeks before, he felt open, was willing to use a variety of words including some "ugly" ones—even though he goes to a State religious school where one of the values is to "keep your tongue (clean)".[12] He felt already that he was in a safe place where the everyday rules did not take place other than the two I tell each child at the beginning of our first meeting: 1. You cannot hit me or hurt me physically; 2. You are not allowed to break anything or damage any piece of furniture, tool, or instrument on purpose.

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[3] It happened only once that after writing "mother" the immediate response was neither a positive adjective nor a name of another family member. In that case the child refused to start the "game" with "mother." As it turned out, he had serious issues with her that were later one of the main reasons his treatment took quite long. In that case I exchanged "mother" with "father".

[4] Advertised as : "The World's Smartest Dog Collar" (http://www.getwuf.com)

[5] The short way of saying: "I am nervous" is "[what] nerves".

[6] The sister's Hebrew name was "Orah", meaning "light". "Sunshine", though not a very common first name, was the best equivalent I have found.

[7] Probably meant the Corinthian Gulf.

[8] The four Hebrew letters written on each side of the Dreidel, a four-sided spinning top, played with during the Jewish holiday of Hanukkah (Jewish variant on the teetotum, a gambling toy found in many European cultures). In Israel, the last letter, the Shin (ש), standing for "there," has been replaced with a Pe (פ), standing for "here."

[9] Eaten on the Jewish festival of Hanukkah.

[10] In the IDF a basic group marching is "left-right-left-right-left-right-left".

[11] A Jewish holiday celebrated on the 33rd day of the Counting of the Omer, which occurs on the 18th day of the Hebrew month of Iyar.

[12] "Shmirat Halashon" ("The keeping of the tongue") is the name of the famous book written by Yisrael Meir ben Aryeh Zev Cohen, also known as "Hafetz Hayim" (Hebrew: חפץ חיים, trans. Desirer of Life), the name of Rabbi Israel's magnum opus (http://www.hebrewbooks.org/14234). The main theme of Rabbi Israel was that a man who had a desire to live should prevent himself from any gossip, say anything evil, insulting, or ugly.

Thus, Guy was willing not just to contribute "un-kosher" words to the game, but even laugh when I did that. For example, when I wrote "steak," which he hated and found disgusting, he responded by "Ugh," and the face he made forced me to laugh. When I wrote "stepping on dog's droppings," he laughed heartily, and then insisted to know the source of my association. He finally persuaded me to tell him a personal thing—a childhood memory—something I almost never do, especially with a child I had just met three weeks before. After I wrote "barking," he wrote "WÜF," which made it clear he implemented the rule, "there are no 'forbidden' words," and understood that I welcomed any expression helping him express exactly what he wanted to. It seemed that my openness with Guy was worthwhile.

After I wrote "nerves," Guy wrote his sister's name, and when he finished he looked at me, making sure I understood why he did that—namely, that his sister used to make him nervous.

When Guy chose the "non-Israeli" version of the four Hebrew letters on the Hanukkah Dreidel, נ.ג.ה.ש., and made sure I knew the difference between this version and the Israeli,[13] he started speaking about his grandfather who lived in Europe and usually came to visit during Hanukkah or around this holiday, [14] bringing European Dreidels as presents.

Here is the translation of the Associations Game I played with Guy five months later.

5. Guy, age 10:9, started meeting me 6 months before

Mother – healing – ***potion*** – gam/marmalade or mixture – ***illness*** – germ – ***penicillin*** – long words – ***teeth breaking*** – hole – ***drill*** – coconut – ***jungle*** – Mowgli – ***childhood memory*** – "grown-up" words – "***when you grow up you will understand***" – "you will understand when you get married" – ***veil (of a bride)*** – dress – ***officer*** [15] – father – children – cousins – celebrations [16] – catering – "***on the fire***" – meat – ***barbecue*** – independence day – ***parade*** [17] – Jerusalem – ***gold*** – silver/money – ***wealth*** – a Talmudic discussion: Does wealth causes happiness?" [18] – ***ambiguous conclusions*** – thoughts – ***intelligence*** – diaries – ***tasks*** – obligations/debts – ***school*** – delays – ***punishments*** – sitting in the corner (in kindergarten) – ***standing with the face facing the wall*** – "I have eyes in the back of my head" – ***glasses*** – I – ***writing*** – literature – ***music*** – hip hop – ***young [people]*** – The Golden Generation – ***The Golden Age [in Spain]*** [19] – the Taz [abbreviated] [20] – ***Yoreh De'ah*** [21] – commentators [of the bible and the Jewish holy scriptures] – ***Onkelos [or Unkelus]*** [22] – Aramaic – ***Yiddish*** – Grandmother – ***Chocolate*** – cocoa – ***cake*** – birthday – ***baking***

Let us analyze this "game" in depth.

Having a mother who was a professional in the mental health area has made Guy very open to the idea that people can help others and help themselves. Thus, his choice of "healing" rather than any other description of what his mother does shows us that he both understood the true character of his mother's work and believed in curing problems by other means than pills or injections.

Unlike in many of the games I have played with other children, when I had to stimulate them to respond clearly, truthfully, and with less inner restrictions, the case of Guy was different. When I suggested we play a second time about six months after we first met, I already knew he was very rich both intellectually and emotionally, extremely open with me, and highly aware of his own feelings, needs, and behaviors. Thus, I truly played with him, let myself follow my own associations without trying to "straighten him up," or "move" him towards a new direction.

My response to "healing" was "***potion***", to which he responded with the Hebrew word "Mirkachat," meaning "gam/marmalade or mixture"—but is also the Hebrew word for "pharmacy" (with the addition of "Beit;" "Beit Mirkachat" means "the house of mixtures"). I wrote "***illness***", not even trying to be original, but when I responded with "***penicillin***" to Guy's "germ," he surprised me with "long words" (indeed, 4-syllable words are rare in Hebrew!). To my "***teeth breaking***", Guy responded with "hole," which is a realization of the metaphor. When I wrote "drill," Guy moved instantly to his childhood: he wrote "coconut." I continued with

[13] See reference No. 8.

[14] Many Jews living abroad come to Israel during Hanukkah which is always in December.

[15] Reference to Isaiah 3:6: "You have clothes, Be our ruler." The Hebrew origin is literally, "[if] you have a dress, you will be our officer."

[16] In Hebrew, the plural form of the abstract verb "happiness" means "happy events." I chose this word to mean the happy events of large, close Israeli families such as the birth of new children, birthdays, Bar Mitzvahs, etc., which occur on a weekly basis.

[17] I was aware that The Israel Defense Forces parade, an event that took place on Independence Day during the first 25 years of the State of Israel's existence, was cancelled after 1973 when Guy's parents were not yet born. However, I used my own childhood association to find out if he had known about it; he had.

[18] "Wealth" and "happiness" are in Hebrew homophones: they are pronounced "Osher."

[19] In Hebrew, these two terms sound almost the same: "Dor Ha'Zahav" and "Tor Ha'Zahav".

[20] David ha-Levi Segal, also known as the Turei Zahav (abbreviated Taz) after the title of his significant halakhic commentary on the Shulchan Aruch, was one of the greatest Polish rabbinical authorities. The Hebrew abbreviation "Taz" is commonly used as the short name of this Rabbi; it is not used as an abbreviation of the Golden Age in Spain, but Guy did not know that. Had it been used these two abbreviations would have been homophones written differently ("ז"ת and "ז"ט).

[21] A section of Rabbi Jacob ben Asher's compilation of halakha (Jewish law), Arba'ah Turim around 1300. The Taz is a commentary on the Yoreh De'ah.

[22] A Roman national who converted to Judaism in Tannaic times. He is considered to be the author of the famous Targum Onkelos, the official eastern (Babylonian) Aramaic translation to the Torah. When saying just "Onkelos," the meaning—whether it is the man or the translation—is concluded from the context.

"jungle" and he with "Mowgli." My "***childhood memory***" was far from being creative expression, but his "grown-ups' words" were; he neither expanded mine nor contradicted them, but rather made fun of them! I gave an example: "***when you grow up you will understand***," and he contributed, "you will understand when you get married." [23] When Guy wrote "dress," I responded with ***"officer,"*** referring to Isaiah 3:6: "You have clothes, Be our ruler." The Hebrew origin is literally "[if] you have a dress, you will be our officer."

The other main issues in Guy's life are revealed from the last part of the game:

1. Guy's family. Guy has a large, close family. Both his parents are comparatively young; he is the first-born with three siblings. He has many uncles and aunts, two pairs of active grandparents and even great-grandparents.

2. Guy, like *all* other Israeli gifted children I have met, suffered in school, mainly of boredom (David, 2009, 2014b; Diezmann & Watters, 1997; Sisk, 1988). This caused many other problems, such as depression, "bad" behavior, tendency to think he knew more than he did because of being told time and again he was "smart," "bright," even a "genius." By helping Guy realize how much he still had to learn, he became more patient with other children who were not as bright as he, and slowly built his own motivation and was willing to work hard in order to realize his true abilities.

In summary, Guy has made very rapid changes both in his behavior and his motivation for learning in just a few months. This could have been predicted quite accurately from the first time we played the Associations Game. This game revealed the following:

1. That Guy was very close to both his parents;

2. That words and books were the main interest in his life; thus, his high cognitive abilities could be successfully "recruited" for the changes he had to go through;

3. Guy was open to understanding his emotions and connecting with them;

4. Guy was willing to use ugly, dirty words which showed his readiness to reveal himself to me even if the sides he exposed were not "absolute positive" according to social and conventional criteria;

5. Guy was not ashamed to reveal "family matters" such as a dislike of his 7-year old sister;

6. Guy had a very rich, varied intellectual world; it consisted of many subjects, some in such depth that he needed expert tutors or mentors in order to satisfy his high level of interest and understanding.

How did the Associations Game influence my intervention?

• Realizing the depths of Guy's interest in Judaism and his high knowledge level, I told his parents to encourage his Talmud learning with adults in a nearby synagogue, as it was both challenging intellectually (unlike Talmud lessons in school) and met Guy's need to be noticed for "clever" ideas—a desire that is almost never satisfied in school when the child is gifted.

• Though Guy had participated in two different enrichment programs for the gifted, a weekly morning pull-out program of the Israeli Ministry of Education (2015), and an afternoon program taking place at one of the universities, his needs were far beyond what these programs offered him. Thus, starting from the summer vacation after grade 5, he started participating in much more intensive scientific courses.

• Realizing how happy Guy was with his family and considering that many of his cousins were also very talented, his parents initiated family activities (e.g., swimming, painting, visiting art and history museums) for a few cousins who were his age but also somewhat older or younger (David, 2009).

• Guy's very high verbal abilities helped persuade him to start literary writing—something he was reluctant to do earlier because of his self-awareness and self-criticism.

• Participating in many more new activities helped Guy meet boys with common interests and some of them became his friends.

• As the needs of Guy were in so many areas, his parents realized he needed to be more independent and they encouraged it in all possible domains. For example, let him travel alone, be responsible for arriving at places on time; make the weekly call to a friend in order to know what he missed in the regular class while he participated in the gifted enrichment program. Thus, not only did Guy grow up emotionally, but his parents did the same—both as parents and as a young couple. They now have more time and energy for themselves after helping Guy and his siblings to gradually need them less for everyday tasks while remaining a very close family both emotionally and intellectually.

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[23] Originally stemming from the warning sign in retail stores: "You break, you pay." In the Jewish wedding ceremony, the bridegroom breaks a glass and afterwards, when he is the legal husband, he is obliged to pay for his wife's expenses such as food and clothing. It became an Israeli proverb meaning, "you are still too young for that, but when you are old enough to get married you will understand."

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Book Review by Elaine S. Wiener

Creativity for Everybody
Kathryn P. Haydon and Jane Harvey

This is a playful book—a little book—a joyful book!

And since this is the 100th year of the birth of the monumental E. Paul Torrance, it seems appropriate to call this book *Creativity for Everybody.*

Each page pops with original ways to express what it says. The authors want the readers to be comfortable with their own creativity.

"Do you realize that creativity is one of your prime superpowers?" the writers ask (p. 7). I expected a Shazam to follow.

"The simple awareness of what creativity actually means can be transformative. It can help you navigate obstacles, enhance your relationships, and connect you to your purpose, whether at home, work, or school" (p. 7).

And that sets the tone for the rest of the book because, obviously, we stop ourselves from being creative. Kathryn P. Haydon and Jane Harvey teach us how to be free!

While talking about creativity, each page communicates its message in innovative ways. Pictures and drawings, important sentences in red, secret messages along the edge of the page in small print and written up the side all want us to be kids on a scavenger hunt.

Many subtitles tempt us into further reading:

• Creativity is Shifting Perspective
"Creativity is the ability to think differently" (p. 13).

• Creativity is Freedom
"The more choices we have, the freer we are" (p. 19).

• Creativity is Personal
"In order to survive and thrive, we need to start with what we have" (p. 23).

• Characteristics
"Individual creativity is unique. Many of the qualities are part of all of us, but some shine brighter or flicker at different pulses" (p. 27).

• Practicing Creativity
"Curiosity involves a sense of wonder, exploration, searching, and inquiry" (p. 31).

• Openness
"Maintaining an open mind leads to creative insights" (p. 33).

• Inquiry
"To do this, we have to be aware of how we ask questions" (p. 35).

• People
"People are part of our ecosystem, and oftentimes they can be biased against creativity" (p. 49).

A section called Dig Deeper (pp. 70-81) has a list of the finest books about creativity. I'm sure that looking up Creativity on Google would provide a huge list, but I would be content with what Haydon and Harvey call "endnotes."

In this year of celebrating Dr. E. Paul Torrance's birth, this little book, *Creativity for Everyone* would be a sparkling gift!

Creativity for Everybody
Kathryn P. Haydon and Jane Harvey
(2015) Sparkitivity, LLC and Jane Harvey
paperback, $13.95, 81 pp
ISBN: 978-0-9963856-9-5

Elaine S. Wiener has taught gifted children in Garden Grove unified School district most of her career. She has served on the Board of Directors of the California Association for the Gifted (CAG) and as Associate Editor for the *Gifted Education Communicator*. Elaine has contributed numerous articles for this widely respected publication and continues to write book reviews, sidebars and her column (Carpe Diem). She received CAG's Award of Recognition in 2004. 17elaine@att.net

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