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Designing and Delivering a CPS Workshop to Middle School Students; Designing and Delivering a Workshop to Introduce the Creative Problem Solving Process and Associated Divergent and Convergent Tools and Techniques to Middle School Children

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Designing and Delivering a workshop to introduce the Creative Problem Solving Process and Associated Divergent and Convergent Tools and Techniques to Middle School Children.

by
Paul Guthart

An Abstract of a Project
in
Creative Studies

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

May 2008

State University of New York
College at Buffalo
International Center for Studies in Creativity

Abstract

This Master's project write-up details my rationale, design and delivery of a two-day training seminar aimed at teaching middle school students and teachers a modified version of the formal process of CPS and associated divergent and convergent tools. The research supporting my decision to undertake the project is based on the undeniable need to educate children on creativity, creative thinking and problem solving skills. Being a father of a middle school aged child further emphasized the need to design a project that had personal meaning as well as give students the opportunity to learn these important skills. Contained in this paper is the actual process and timeline of the program as well as research that has been conducted that explains this need to teach children creative thinking skills. Key learnings and future opportunities are also outlined.

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Date of Approval:

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Dedication

To my wife, Amy and my children, Alexandria and Gabrielle, whose love, encouragement and support has helped me pursue my dream after many years. Thank you for giving me the time and peacefulness to complete my degree and to start pursuing my dream. You empower me, I Love You all!

Acknowledgments

Dr. Puccio, Thank you for all you have done in enabling me to complete my degree. Your support has given me new perspective on my future.

Dr. Murdock, I vividly remember you reading the Manifesto for Children by E. Paul Torrance in one of our classes together. In pursuing my degree, I take these words to heart and it gives me strength.

ICSC faculty and staff, Thank you for assisting me through my life journey. All of you are phenomenal!

Section One

Background of the Project

Description

My Master's project involved designing and teaching a workshop to introduce the Creative Problem Solving (CPS) processes and tools to middle school children and their teachers. The need to undertake this project stems from the fact that my child's middle school curriculum did not include any creativity training. The King David School, located in Scottsdale, Arizona, is a Jewish day school committed to providing a higher standard of secular learning for its students. As an involved parent in the quality of my children's education, engaging in this project was the perfect start to introduce creativity training.

Rationale

When I initially introduced the idea of presenting a CPS seminar to the middle school director, Sherry Saper, in March 2007, she was very excited and believed that it would be a great opportunity and benefit to the students and teachers. I presented Sherry with some information on the International Center for Studies in Creativity as I developed my proposal. Shortly thereafter I delivered the proposal to Sherry and explained my outline and delivery methods.

As a candidate for a Master's degree in creativity, I believed that this challenge would not only tap into my past teachings of creativity but also allow me to delve into current research on the need to teach children creativity skills. The project would stretch me to review and polish my presentation skills and at the same time give the school a program that potentially can be integrated into the curriculum.

Objectives

Some short-term objectives that I outlined in the beginning of the planning phases of designing the project were for the children to experience a new and exciting lesson that has the potential to affect everyone in attendance. The primary objective was for the students and teachers in attendance to learn, understand and use the basic principles of the CPS process and various selected divergent and convergent tools that I will expand on later. Another objective was for the teachers present to be able to incorporate some of the material I presented into their lesson plans. As part of my initial long-term objectives, it is my belief that the children and teachers would transfer and internalize the CPS process and tools presented toward other challenges and opportunities.

Some key benefits of engaging in this project are that it was a huge motivator for me to re-examine my commitment to the field of creativity. Being somewhat disconnected from the ICSC for a while, designing the project added a sense of connectedness. The project afforded me the opportunity to review an abundance of books, materials and handouts I received during my graduate studies. It challenged and added to my love and appreciation of the field. Additionally, reading two newer creativity books, *The Handbook of Creativity* (Sternberg, 1999) and *Creative Leadership: Skills that Drive Change* (Puccio, Murdock & Mance, 2007), further assisted in reconnecting myself to the study of creativity and in the design and content of the program.

I strongly believe that the undertaking of the project in many ways has added a renewed clarity and insight to my own creative growth. The project has presented other options in regard to what opportunities I would like to pursue as a creative professional. I

found that in designing the project my personal creative growth was affected. What I mean by this, is that in reviewing literature and facilitating my own problem solving in designing of the seminar, I felt closer than I have in a long time, to engaging myself as a creativity professional. The project challenged my own creative process to design a program that was not only entertaining for the audience I was presenting to, but deliver sufficient content that was age appropriate and allow for students to transfer the content presented. Another dimension of my own growth is that I can incorporate my framework of the presentation to future programs I deliver. The project has opened up potential avenues of opportunity to seek out other schools and organizations willing to introduce creativity training to their teachers, students and employees.

I have already witnessed how my project increased the quality of life for the middle school students and teachers. Some students have already commented to me on not only how much they enjoyed the program, but how they used some of the tools presented to prepare and write final papers. I have also heard from parents, thanking me for presenting such a wonderful seminar. I know for a fact that my middle school student does not really tell me much about what went on with school, so when I heard from their parents, I knew I made an impression. I have also been asked to present a workshop to the elementary teachers of the King David School. I consider this invitation to be of major importance as is proves that the presentation was a success and the school is willing and open to introduce more creativity programs to enhance and develop their students and teachers. It is my hope that teachers in attendance will hopefully be able to utilize and transform the material I present and transform and adapt to their lesson plans.

The project has added a new level of creative growth to the teachers and students of the school.

Section Two

Pertinent Literature

The Educational System

If I reflect on why I chose to engage in the undertaking of this project as opposed to another, the answer is quite simple. I have witnessed how my own creative abilities and potential have been affected. How I use creativity as an integral part of my daily business and work life. I want the same opportunity for my children to be educated in the field of deliberate creativity. Maybe not to the same extent as I have pursued in my life, but at least educated with the basic knowledge of CPS, divergent and convergent tools and techniques. By educating my children and others to enhance and develop their own creativity it may potentially provide them the creative "trump ace" as they cross the threshold of our highly competitive academic and business worlds. What I found interesting was that I knew the project was important to me and the school, but the real connection did not click in my head until a month after I delivered the seminar. I was in Buffalo attending the CRS625, Current Issues in Creativity, course. In one of the classes we were introduced to a video presentation where Sir Ken Robinson was addressing attendees at the 2006 TED Conference. Sir Ken was the keynote speaker. In his address he asserted that we are literally teaching the creativity out of our children (Robinson, 2006). Sir Ken Robinson was knighted by Queen Elizabeth II for his services to children's education and the arts. I had my "Ah-hah". It's true; schools are progressively teaching the creativity out of our children. I reflect back on my oldest daughter's early

elementary teachings and think that as she progresses into higher grade levels, the focus on creativity decreases.

Schools today are focusing more on the teaching of science, mathematics and language. Humanities, is next on the list with the arts, dance and drama being last. It is these artistic disciplines where children most often discover and exercise their creativity. Consequently, these artistic programs are the first on the list to suffer from budgetary constraints (Greensill, 2007).

Robinson is further cited in another article by Simpson (2007), reviewing an address he was giving at the University of Oklahoma. He stated that education systems fail to recognize, much less cultivate creativity and innovation. He adds children are characterized as either intellectual or creative and artsy. The disciplines need to be balanced instead of dividing them into hierarchies. “We are clinging to a very narrow view of intelligence, everybody has extraordinary creative abilities. The issue is to discover them.” (Robinson, 2007)

Further evidence of our early educational systems ability to cipher our children’s creativity was presented by Land and Jarmin (1992) in a longitudinal study where they administered eight tests of divergent creative thinking to 1600 three to five year old children involved in the Head Start program. The Head Start program is a National Act that promotes school readiness by enhancing social and cognitive development of lower income children. Ninety-eight percent of the children involved scored in the genius category for divergent creative thinking. The same children took the same tests five years

later and the percentage of students in the genius category had dropped to 32%. Another five years and the percentage dropped to 2%. This decline in our children's creative ability is alarming. Children are being molded to conform to societal norms which are restricting their creative juices from flowing. I would argue that the children tested do not necessarily have to be from lower income families. This is taking place in schools all over the world. Land and Jarman (1992) described how most, if not all, kindergarten aged children will say "yes" when asked to paint, draw or dance. When you ask graduate students the same questions you get excuses on why they can't. However, Land and Jarman (1992) have seen by studying adults that there is a five year old genius still inside.

Another example of ways that children's creative drive and passion are crushed is presented by Amabile (1989) who stated, "Children's motivation and creativity can be destroyed if evaluation, reward, and competition are misused, or if choices are too restricted…Rules that control, rather than inform, can kill creativity" (p. 69). She further mentioned that in helping children realize their own potential we coerce them into doing and learning. By coercion, Amabile is referring to potential overuse and overemphasis on rewards and praise. As a parent I am guilty of offering rewards to entice my children to do things I want them to do and discourage certain activities and actions they want to do. Granted, there are situations where parents need to entice their children. For the most part, we as parents, need to be mindful of those situations of where and by what means we are rewarding our children.

Amabile (1989) further identified four methods for killing children's creativity; evaluation, reward, competition and restricting choice. When children are subject to

evaluation, the products they produce have shown a decline in creative output as opposed to children who did not receive any evaluation. Amabile used spin paintings created by children as an example of how the children became discouraged because their art was subject to criticism.

Reward can be a very powerful creativity killer. Amabile believes there is a hidden cost in the giving of rewards. One is that intrinsic motivation is sacrificed. Our ability to create something out of our own enjoyment is replaced by creating or doing for the attainment of reward. Amabile makes reference to the writer T.S. Elliot who suffered from severe depression after winning the Nobel Prize in literature.

Competition, according to Amabile, involves both evaluation and reward. Competition becomes apparent when people feel that their performance is going to be measured against others and the winners will receive a reward. Competition is a reality in today's society. Early competition is apparent in our children to vie for rewards offered by teachers and parents to perform.

Restricting choice is the fourth creativity inhibitor identified by Amabile. She cited Albert Einstein, who was educated in a militaristic school where he was forced to learn material through memorization in a heavily disciplined environment. Einstein commented that the coercion had a detrimental effect on his desire to pursue his own intrinsically motivated studies. It was distasteful to him.

Children need the freedom to express and challenge their own creative potential. This does not mean that we as parents, teachers and caregivers, give them free reign to do as they please but rather structure programs designed to foster spontaneity, risk-taking

and freedom. We need to find ways to teach our children to respect rules and limits without diminishing their creative output. To accomplish this we must teach our children not only what the "rules" are, but why they are necessary. Our children need to have goals that extend to their abilities. They need a supportive environment that rewards failures as well as successes. Today's student generally works on problems that have been assigned by their teachers. This poses less challenge for evaluation than having students work on problems that they find themselves. Students need to have opportunities to learn from personal experience in order to advance their own creative potential. This does not mean that students should only work on problems that they themselves find (Sternberg, 1999).

Martin Johnson, head of education policy for the Association of Teachers and Lectures (ATL), has criticized the Government and the emphasis placed on students' standardized test scores in primary schools. He asserts teachers are spending too much time preparing children to pass Government target test scores. As a result children potentially miss out on other subjects. According to Johnson, "Our over-drilled children are losing the ability to be creative, self organized and make connections between different subjects" (Education, 2006). Johnson adds that primary schools are spending too much time on English and math to ensure test scores comply with Government standards. In the pushing of our students to score well, these tests have created a boring and un-motivating learning environment. In the end we are teaching students how to pass tests.

I can tell you from experience that my children were victim to this type of teaching methodology before I enrolled them in The King David School. My middle

school daughter is a bright and quick learning student. When she was young she attended a well-respected day care facility in our community. They also offered kindergarten. My child excelled in the creative and flexible environment of this school. In first grade, she was in a class comprised of students in first, second and third grade. This special program gave a fabulous opportunity for our daughter to learn at a pace with which she was comfortable and at the same time allow her to be challenged. In second grade we switched school districts and the style of teaching for test styles outlined previously were clear as day. My daughter, being one of the brighter children in the class suffered as a result of the teacher's and administration's focus on devoting more time and energy to children whose test scores needed improvement. As a result of this focus on others, my daughter and a few other children became bored with the material being taught and as a result started to cause trouble in the classroom. My pleadings with the teacher and school's administration to test her to a gifted program were denied. Their policy stated that children needed to at least be in third grade for gifted and talented testing. Despite my continued requests there was nothing I could do to assist my daughter. At that moment, sick of fighting, I knew I had to provide my daughter with a learning environment that would foster her creative potential. After evaluating several private schools and speaking with many parents about their children's schools, I chose the King David School (KDS). As a private Jewish day school, KDS also offered a creative approach to delivering secular studies as well as Hebrew and Judaics, which was important to my wife and me.

I believe today's teachers need to start embracing creativity and to nurture it in our children. According to Bunting (2006) teachers need to "connect personally with teaching" (p. 76). The average classroom is so heavily filled with structured elements that teacher ownership, joy and creativity tend to have no place in the classroom. For teachers to get personal about their teaching they need to give life to their talents and trust their gut instincts. Teachers need to think back to why they became teachers in the first place. By reflecting on their desire to teach and taking it forward by bringing that drive into the classroom teachers bring the personal element back into the classroom.

On the other side of this spectrum we have teachers who are unable to change their teaching methods due to social expectations and personality traits. Today's teachers find it hard to change as they are occupied with the critical and remedial (Dacey, 1989). Dacey also believes that teachers fail to protect students whose creative thinking abilities are superior to others. As a result these students experience outside pressures to reduce their originality and productivity.

Sternberg (1999) believed that the attitudes and values that are germane to the development of creative potential are best taught by example. If teachers do not demonstrate an interest and a level of excitement in the lessons they are teaching or to be open to new ideas or value curiosity, then how can we expect our children to do the same?

Unfortunately, creativity training is not yet a part of most schools curriculum despite the growing need to foster creativity in students and teachers. Some commentary has been circulating claiming that education of our children is moving towards a more formalized genre of learning as opposed to a curriculum focused on our children (Craft; 2003). Some of the reasons for our children's structured learning might be attributed to the No Child Left Behind Act (NCLB). One of the reasons the act was initiated, was for children to score better on tests than those of Chinese and Indian students. The NCLB has mounted extensive pressures on our school systems to teach children to score better on State tests. Due to the pressures of the NCLB, schools are limiting what is taught and teachers focus on preparing students to perform well on these tests which are robbing our children of a learning environment where they can express and grow their creative potential. As US policies are leading us further and further away from creativity in the classroom, other countries are adding creativity and flexibility to their curriculum (Zhao, 2007). In a newspaper article by Blobaum (2007) teachers complained that the NCLB's focus on math and reading are taking away from other subjects such as social studies. They claim the result is the production of good test takers at the expense of creativity and critical thinking skills.

Business leaders such as Gates (2005) have commented that America is falling behind in the international competition of knowledge workers. "We'd better do something about these kids not getting an education, because it's hurting them. Gates and other education reform business advocates have been communicating the sense of

urgency for more future oriented education in order for our children to compete with their foreign counterparts.

It is argued by Zhao (2007), that American leaders are confusing technical skills with creativity. As a result, the US has been focusing on increasing our student's achievement while Asian nations are working to close the creativity gap as the US has been the world leader in innovations for the past 150 years.

New concepts and creative solutions arise when people have abandoned established practices and habitual thinking. Outside the box thinking is harder to achieve in adulthood as it has been taught out of us. Children begin with a clean slate; they do not limit their imaginations through premature evaluation (Welzien, 2006).

If the US continues stressing the importance of passing tests and decreasing our teachers' ability to design creative and innovative programming for our students, we could possibly face an epidemic of thinkers who have been systematically drained of their creative ability. To cite Robinson (2006) again, "we are teaching the creativity right out of our children This message is incredibly simple yet profoundly powerful. The implications for not adapting policy to teach and enhance creativity are beyond measure as competition to innovate and create technical advances among nations grow.

Parental Influence

Another major influence in fostering creativity in children is parents. Parents have a tremendous amount of influence over their children. Children look to their parents as influential role models. As parents we are primarily responsible for their creative development in their early years and beyond. Our children need to be stimulated and

challenged. It is just as important that we allow our preschool children to express their creativity as it is for our school aged children. Parents who do not encourage creative learning activities are just as guilty as our teachers and administrators in allowing children to be stifled. Allowing children to express their creativity in the home is just as important as children needing to be stimulated and challenged at school.

According to Hoyt (2001), creativity is about a child's ability to come up with workable solutions. They need to look at a problem with flexibility and imagination. She explains parents need to give their children the freedom to explore their own creativity, nurture their interests and provide enough time for their children, as some parents tend to over schedule their children which in turn can dampen their creativity. She also mentions that our school age children are prone to conform to rules and other children, which in turn can diminish their creativeness.

Parents also need to be conscious of the language they use with their children. Phrases that parents use with their children can be resistors to creativity. Kutner (2000) identifies six things smart parents almost never say. These phrases are potentially damaging to a child's self esteem. Such phrases include; "You should try harder!", "Why can't you be more like your sister/brother", "Do that again and you'll really be sorry", "If I've told you once, I've told you one hundred times", "Did you win?" And, "I'm so mad at you."

These phrases, if used often enough can be very damaging to a child's creativity. There are other ways parents can express themselves in a more creative and open fashion. Instead of saying, "You should try harder," the parent could say, "Why don't you try it

this way" or instead of saying "Did you win?" parents should say, "Did you have fun? Or "Did you learn anything?" These statements allow for a more in-depth response, entice sharing and avoid confrontation. Parents need to be able to convey praise and disappointment in more creative contexts.

Children will enjoy themselves more if they are allowed to explore without criticism according to Kenison (2007). Parents who set examples in their own creative pursuits, whether it is the food they prepare or the clothes they wear, set an example for their children. Creativity is not limited to our children. Children who grow up believing "we can make it ourselves" have a firm foundation upon which to build their own endeavors.

I'm sure that parents looking closely at their children's class schedules and homework can certainly see where the emphasis of learning is taking place. As creative professionals and parents we have the obligation to act, if only on a local level to assist our teachers and school systems and institute creative programming into our schools. Based on my observations of the trends found in the creativity literature, especially with respect to schools, and the problems I had in obtaining the right learning environment for my daughter, I decided to pursue a Master's project that would have personal meaning for my family, as well as an impact on our local school.

Section Three

Process Plan

The project involved the design and delivery of a two-day introduction to CPS process, tools and techniques to approximately 50 middle school aged children. Due to time constraints and attention span of my audience, I needed to carefully decide what type and amount of information I wanted to deliver.

The content and delivery of the project, I feel, were some of the more challenging aspects of the project as well as trying to maintain an environment conducive to learning. What I mean by this is that it is extremely challenging to entertain and control 50 middle school students. One of the biggest challenges in developing the workshop was that I needed to tailor the content so it would be understood by all three grade levels present. I also needed to be able to include activities that kept the children interested and allowed for transfer of knowledge. Additionally, the presentation needed to be fast paced and entertaining to keep the student's attention. What follows is the training agenda created for the two-day workshop.

Day 1

10 – 15 minutes – Introductions and Objectives

"My name is Paul Guthart and I am here today to deliver a two-day creativity and problem-solving seminar. There are many reasons why I am doing this with the KDS middle school. First, I am a candidate for a Master's of Science degree in Creativity and Change Leadership from the International Center for Studies in Creativity (ICSC) at Buffalo State College. My interest in the field of creativity began when I enrolled in a

college class called Introduction to Creativity. From the moment the professor introduced herself and had the students in the class share why we chose this class I knew that this class was going to be very different from other classes I had taken."

"Another reason I am here is I have an interest in sharing my teachings in creativity and problem solving with you as there is a huge need to have you students armed with problem solving tools."

The objectives for this two-day workshop include:

- Learning and understanding the CPS process. CPS is a flexible process designed to assist you in solving problems in a creative manner.
- Learning divergent tools for generating many options/ideas.
- Learning convergent tools for selecting promising ideas.
- Steps to prepare your ideas for implementation. Take your idea(s) forward.
- Having FUN!

A. Explain the CPS process steps of: clarifying the problem, generating ideas, develop solutions and implementing action plans. We will do exercises for each of these steps. – Handout CPS lite process.

B. Expectations – that you will be able to facilitate your own problem solving process tomorrow with one of the organizations that have volunteered to have you help them creatively solve a problem.

1. Warm up activity- 20 minutes –

A. What is creativity? Some discussion with students on this – write answers on chart paper.

A. Slide – Creativity is making novel associations that are useful

B. Slide – Madness, Mysterious, Magic

C. Instead we like to view creativity as – Slide – Healthy, Understandable, Natural

D. Slide- How creative are you?

E. Number slides – patterned responses – 1000 + 40 +1000+ 30,etc

2. Creative environment – 20 minutes

List responses from group on chart paper

A. Makers/breakers- discuss different makers/breakers – verbal and non-verbal

B. Praise and criticism – how does praise and criticism affect ideas/people?

C. Habits- how do our habits affect generating and accepting ideas?

D. Blocks & barriers

i. List all the words used to squash, kill, mutilate and destroy ideas.

ii. List all the ways people can praise and support good ideas

iii. Short debrief on this exercise – easier to kill an idea than to encourage it.

Short 5 minute break

3. Introduce the four P's of creativity 15 minutes – Person, Product, Process and Press

A. Slide – productive approaches to creativity

B. Discussion with group – what factors/traits are seen in creative people?

4. Present and discuss the CPS model 45 minutes

A. Discuss the creative process

i. Descriptions of:

ii. Clarifying the Problem

iii. Generating ideas

iv. Develop solutions

v. Implementation plan

5. Discuss the dynamic balance needed between divergence and convergence. Discuss how each of these tools is important for new and useful solutions to be developed.
6. Conduct bathtub exercise with students (Divergent exercise) – breakout into smaller groups of 5-6. Have the group select a person to write ideas down. Stress that the idea writer is a functioning member of the group.
7. Continue with 3 rounds of diverging stressing each time to come up with more ideas. Introduce forced relationships and SCAMPER, Post-Its™ as a way to generate many ideas. (handouts)

Short debrief – how did that work? Did you see yourselves stretching and hitchhiking off of each others ideas? How many truly outrageous ideas? Discuss how generating many options and even some crazy ones boil down to useful ideas in the convergent phase of each step.

Lunch -

8. Discuss the benefit of having a clear and properly formatted Problem Statement – 10 min-Wouldn't it be nice if? WIBNI Components of a good problem statement. Owner, action, what? How to refine fuzzy or unclear problems or too broad or narrow – how and why? – Because of our limited time we have already developed clear problem statements for today and in your groups tomorrow.
9. Generating Ideas-10 min– suspend judgment, reach, forced relationships, SCAMPER, Brainstorming bag of tricks. Convergent- finding the hits and hot spots, screen, select and supporting ideas.
10. Review Guidelines for - Developing Solutions– 10 min. Advantages, Limitations, Unique connections (ALU), evaluation matrix (handouts)
11. Review guidelines for Implementing Action Plans – 10 min – Assistors and Resistors, Implementation plan – short term (24 hours) long term (plan of action worksheet)

Break 5 min

12. Conduct sample CPS process with me as facilitator 45min – 1 hour – chose 2 students to help log ideas.

    Choose faculty or staff ahead of time with challenge they want to use CPS on – This will give students opportunity to see what they will do tomorrow.

    The challenge that we used for this exercise was a very timely and important topic that the middle school students wanted to work on. They were recently informed that the casual dress policy that was promised to them was being

revoked. Many of the students were quite upset as they were promised by the previous administration that casual dress would be allowed for all middle school students. Previously the students had to wear uniforms.

We generated several good ideas and an action plan for the students to take to the administration to convince them that the original promised policy should be re-instituted.

Break 5 min

13. Debrief CPS session 15- 20 min– What questions, concerns, comments do the students/teachers have? Does anything need to be reviewed? Discuss what tools and techniques they felt generated the best ideas. What might we have done differently?
14. Prepare for students ½ day CPS session – choose teams and facilitators, idea loggers. Bring divergent bag of tricks for groups. Give facilitators a guide sheet of the process to aid them in their own sessions. Go over facilitators roles.
15. Introduce the organizations/people that will be in attendance and share nature of problems to be solved.

Day 2

The purpose of this day is to have the students apply what they have learned about the CPS process, tools and techniques to conduct a CPS session with a real problem introduced by several students needing creative answers. A clear problem statement will already be formulated in order for the students to concentrate on assisting client with

useful and novel ideas. We will also introduce the process and CPS tools to our "clients". It is my goal that the students will be able to apply the CPS process with a "client" on a real problem and help generate some useful ideas for the client to form a viable action plan.

The clients in attendance for the workshop included: Alan Gellman of Cardinal Pointe Communications and Jon Benjamin of Wright Medical. Mr. Gellman was searching for ideas on how to best affix a specialty vinyl mesh to a concrete wall. Mr. Gellman and I decided it would be best for him to bring a sample of the material and a list of what he has tried in the past and whether or not it worked. The main challenge was that traditional adhesives would not stick very long on the porous surface. Mr. Benjamin was looking for creative ways to convince orthopedic surgeons to try a new type of hip replacement. His main challenge was that the surgeons were traditionally used to using devices that they have used in the past and have become comfortable with. Mr. Benjamin's company manufactures joints that allow for a greater range of motion.

Introductions and warm ups – 20 min

1. Introduction of clients to students
2. Warm up activity Introduction of names with an adjective i.e.; poetic Paul
3. Imaginary ball to learn names- I toss an imaginary ball while speaking the name of the person I am throwing it to- they in turn toss the imaginary ball to another person and say their name.
4. Introduce the CPS lite process to our "clients".

5. Go over rules for divergent and convergent thinking.
6. Breakout into CPS groups (4-5 groups depending on number of students and those willing to facilitate. Every student will be a contributing member to the "clients" team.

Each group will go through the steps of Generating Ideas, Developing Solutions and assisting client in developing an action plan.

7. Generating ideas – 15-20 minutes

   Student facilitators and participants will use tools learned the previous day to help generate many novel and useful ideas for the client. SCAMPER, Forced relationships, brainstorming.

8. Developing solutions – 15- 20 minutes

   The student facilitators will introduce convergent tools to the client for evaluating ideas. Advantages, Limitations, Unique connections (ALU), evaluation matrix (handouts)

   This will give the clients some feasible ideas to work with in the Implementation process.

9. Implementing Actions – 15- 20 min

   Students will assist clients in formulating immediate steps to get the selected ideas into action. Develop short term and long term actions.

The teachers, myself and some former CPS students will monitor each group's process and be a resource to ensure the process moves smoothly for all groups.

Break – 10 min

Debrief – 15- 20 minutes

We will come back into 1 group and debrief the CPS sessions the students conducted.

Did the clients come away with some feasible implementation plans?

What benefits do they see in the creative process for solving problems?

Questions, Comments, Concerns?

Thank you's

Key People Involved in Workshop

One of the key people that contributed to the project's success was Sherry Saper, middle school director for the King David School. Without Sherry's help and dedication the workshop would have never happened. She was instrumental in conveying my desire to present the workshop to the school's principal. She assisted in reserving the meeting space and all audio visual equipment needed. In addition, Sherry was a key person involved in the client facilitation on day 2. Her responsibilities included preparation of the facilitation area as well as to assist the students during the active portion of the facilitation with the client. Sherry also was instrumental in having the students fill out a web based survey I prepared for feedback on the presentation.

David Chenko, the schools math teacher, was another key person involved. David was skilled in maintaining student control throughout the presentation. He also assisted in

preparing the room and was extremely helpful in helping students as they facilitated the clients.

Kathy Davis, a language arts teacher, was also present for the program and found the entire presentation of value for continued teachings. She realized the real value of having the students skilled in idea generating tools to help with creative writing assignments. Kathy was also very helpful in maintaining control over the students.

Sherry, David and Kathy were instrumental in ensuring the project was a complete success. I am so thankful for their assistance.

Section Four

Outcomes

The workshop turned out to be a huge success. The students had a great time and generated some workable solutions for the student problems presented. From the feedback I received most of the students enjoyed the presentation and more importantly, learned valuable problem solving tools. During the debrief of the two-day session many students connected with the material on a personal level and indicated that they would be able to use apply the content presented to their studies and home life. As mentioned earlier in this paper, it was my hope that the students would transfer and internalize the tools and techniques I presented to them.

Another outcome was the impact on the teachers who were present for the presentation. They have all mentioned what a benefit the session was and how they might use pieces of my session as segments of their lesson plans. The presentation has also led the administration to ask me to do workshops for the teachers and other classes at the school. Initially, I did not expect this but I am elated that the school is interested in creativity training of its teachers and students.

Survey Results

As part of the feedback process I designed an online survey for the students to complete. This would enable me to formally collect data on the students' perception on the effectiveness of the content and how they were able to transfer the information. The format of the survey follows with a summary of the student feedback.

1. In reflecting back on the presentation on Creative Problem Solving did you find the material covered was informative?

	strongly disagree	disagree	agree	strongly agree	Rating Average
Select one	0.0% (0)	4.8% (1)	**81.0% (17)**	14.3% (3)	3.10

2. Did Paul Guthart do a good job of presenting the material in an understandable manner?

	strongly disagree	disagree	agree	strongly agree	Rating Average
Select one	0.0% (0)	0.0% (0)	**61.9% (13)**	38.1% (8)	3.38

3. What divergent (Brainstorming) tools did you like the best? You may select more than one.

	Response Percent
Forced Connections	20.0%
SCAMPER	**55.0%**
Hitchhiking (off others ideas)	35.0%
Freewheel	35.0%

4. What convergent (narowing, selecting)tools did you find most usefull? You may select more than one.

	Response Percent
PPCo - Plusses, Potentials and Concerns	25.0%
Hits & Hotspots	**55.0%**
ALU - Advantages, Limitations & Unique connections	40.0%

5. It has been almost a month since the presentation, do you feel that learning Creative Problem Solving tools has helped your own problem solving skills? Describe how.

very helpful

no

no

kindof - i can solve my problems

no

Yes, when I have a problem I use one of the tools I learned to help solve the problem

I already knew them

helps look at things differently

I can look at many options

Yes, because it got into my head

yes

I learned that anything is possible if you believe

no

It helped me be more persistant in solving problems

Yes, It helped me alot

It has been a great experience

Yes

Yes, I've been using it. I liked it

Moderately so. Truthfully, I have not identified many new creative problems to solve, if any, since the presentation.

6. Would you recommend the workshop to future middle school classes? Why?

definately good for other classes

yes

it was fun and helped

yes it was fun

Yes- it will help others

It shouls be optional

yes can help other students

Yes, it was interseting and helpful

It makes you think about new ways to solve problems

Yes, it was helpful and fun

yes, it teaches valuable problem solving skills

no

Yes, it was helpful

I think it could be neccessary to people because it establishes self confidence and support for original ideas an choices.

Yes, because I learned alot

Yes, it was helpful

Yes, because it was fun.

Yes, It helps you.

Yes, but I would make it of shorter duration, and/or with more breaks.

7. Would you be interested in learning more about Creative Problem Solving tools and techniques?

	strongly disagree	disagree	agree	strongly agree
Select one	0.0% (0)	10.5% (2)	**78.9% (15)**	10.5% (2)

8. Are there any other comments that you wish to share about the presentation content or presenter?
very nicely done!
no
no
no
Mr. G did a grat job presenting
no
no
Paul was nice and very helpful
no
would have liked more "hands on" things to do
no
he was nice
no
He did a great job.
No, other than Paul Guthart displayed great patience and understanding in working with middle-schoolers.

The results of the feedback further show the successfulness of the workshop with the students. I know that future presentations will be modified to take into account the survey results.

Section Five

Key Learnings

At first the students were apprehensive to participate in the workshop. I believe my introduction and explanation of why I was conducting the program was not of particular interest. However, I do believe I gained credibility with the students when I came to one of the first warm-up activities and asked who the math wizards were in the room. After the students identified themselves, I segued into the warm-up activity where I had the students add the 1000+ slides with me. As I predicted the students fell victim to the patterned thinking trap and I was joisted to a position where the students knew I had something to offer. I still had to do a lot of chit-chat control and in the future I believe that I would restrict the amount of material that I wanted to cover. I would also cut back on the amount of material to present. For example I might focus more on the tools of divergence and convergence rather than trying to integrate them into a formalized process.

The planning and development of the workshop allowed me to catch up on some of the recent literature and changes in the field. I found it extremely helpful to read, *Change Leadership: Skills that Drive Change* (Puccio, et al, 2007) and *The Handbook of Creativity* (Sternberg, 1999). These two books gave me an incredible amount of insight as well as cited prior research and new tools that were of great value in the design and delivery of the program. Additionally I spent many hours reviewing written materials from my creative studies classes I had accumulated throughout the years.

I was very fortunate that Sherry Saper and the King David School staff were open to the idea of having me present this useful workshop to the students and teachers. I did not have to "sell" the idea as the schools philosophy on education is open and progressive. KDS is very open to new ideas, teachings and experiences that enhance the student experience.

I personally stretched and developed my own facilitation skills in designing and delivering the workshop. The content I delivered to the students challenged my own domain relevant skills in the field of creativity and I drew upon several years of creativity and problem solving training. Domain relevant skills included all my knowledge, experience and skills (Amabile, 2001). As I mentioned previously, I made a big impact on the school and the students in delivering the program. Sternberg (1999) asserted that people who produce creative work are most likely very knowledgeable about the domain. Obviously this is important as this project drew on not only my knowledge of CPS but on my natural ability to entertain people. Amabile (2001) identified three components of creative performance. Domain relevant skills include specific knowledge of the topic being delivered or studied. In this case CPS. The workshop challenged my knowledge, education and skills of CPS to deliver the program. The second component, creativity relevant skills, relates to my work style, and cognitive style as well as heuristics for generating novel ideas. I developed a novel program to deliver to the school. One that I know I will be presenting again with some minor modifications in content. Lastly, task motivation called on my attitude and motivation for taking on the project. This project

was important to me as I benefited the school, students and my daughter by teaching and exposing them to a new area of learning.

As the students were of varying ages I needed to ensure the vocabulary of the content I was delivering was appropriate. I made sure to clearly define the new vernacular I was introducing to the students. I created handouts for the students and faculty in attendance so they could follow the presentation. The handouts gave good insight into the level of CPS content I was presenting. As I mentioned earlier in the paper, the presentation was more closely focused on the processes of diverging and converging on a problem, rather than the formation of a problem or challenge.

What was helpful was giving the students a clear view of the objectives for the two days and allow for some questions from the participants before we dove into the presentation. This was a good pre-icebreaker that I believed worked well.

In the future I would modify the presentation a little to allow for a deeper transfer of knowledge to the students. I believe that more time would be needed to have the students absorb the process and tools. I would rather focus more on divergent and convergent tools than on the actual CPS process. I also believe that preparing and delivering a presentation for the teachers would be beneficial as they will be able to assist on a higher level when I present to the students. I would also pre-assign the students to their breakout groups. I believe this would cut down on the amount of “chit chat” as it was challenging to keep 50 students focused and entertained. I would also advise that the seminar to be delivered to a smaller portion of the middle school as controlling 50 students is a certainly a challenge.

Conclusions

If I take a look at my journey in the planning, developing and delivering the project to the middle school students, I learned a few things about the field of creativity and change leadership. In preparing for the seminar by studying and reviewing the research related to my project I realize now more than ever that the lack of creative content being taught to our students is reaching epidemic proportions. There are literally thousands of articles published that relate to our country's obsession with scoring higher on standardized tests while systematically teaching the creativity out of our children. I also know and am empowered by the fact that I am an agent and facilitator of change, with the knowledge, skills and ability to reach out and impact those whom I meet and are open to learning how creativity is an essential human trait that can be enhanced.

What I see myself doing next is designing and delivering various programs and workshops to different organizations. With my background and education I would deliver presentations where the content is grounded in research as opposed to opinion or past history. I believe this approach strengthens my credibility and standing as a creativity professional. I am incredibly excited to create my new future. I know that delivering the workshop to the King David School students was as an excellent springboard for future endeavors.

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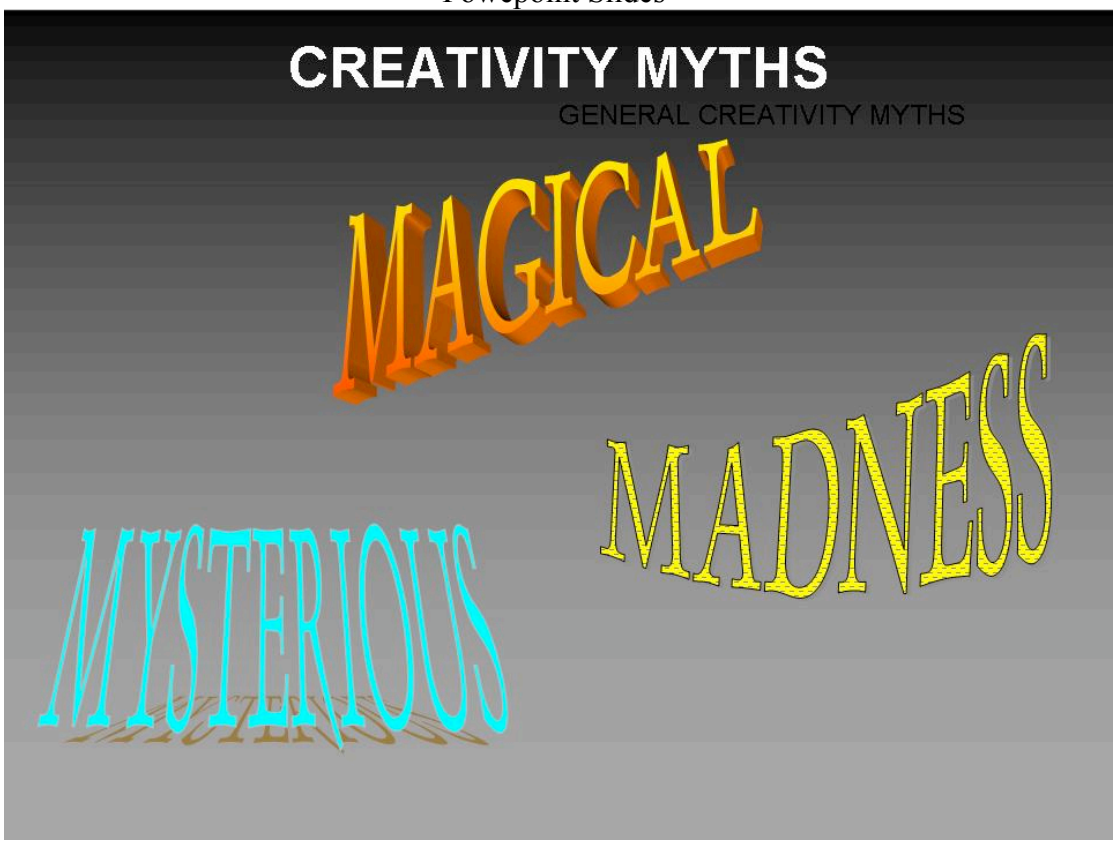
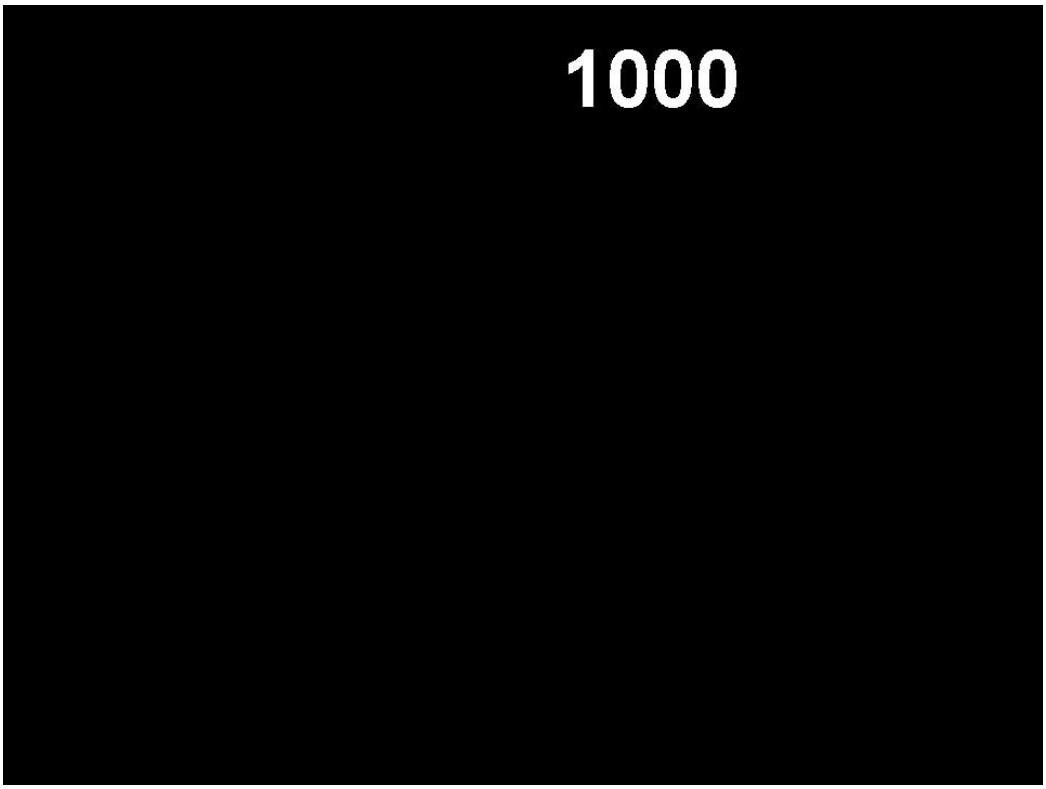
Appendix

Powepoint Slides




PRODUCTIVE CREATIVITY ASSUMPTIONS
HEALTHY
NATURAL
UNDERSTANDABLE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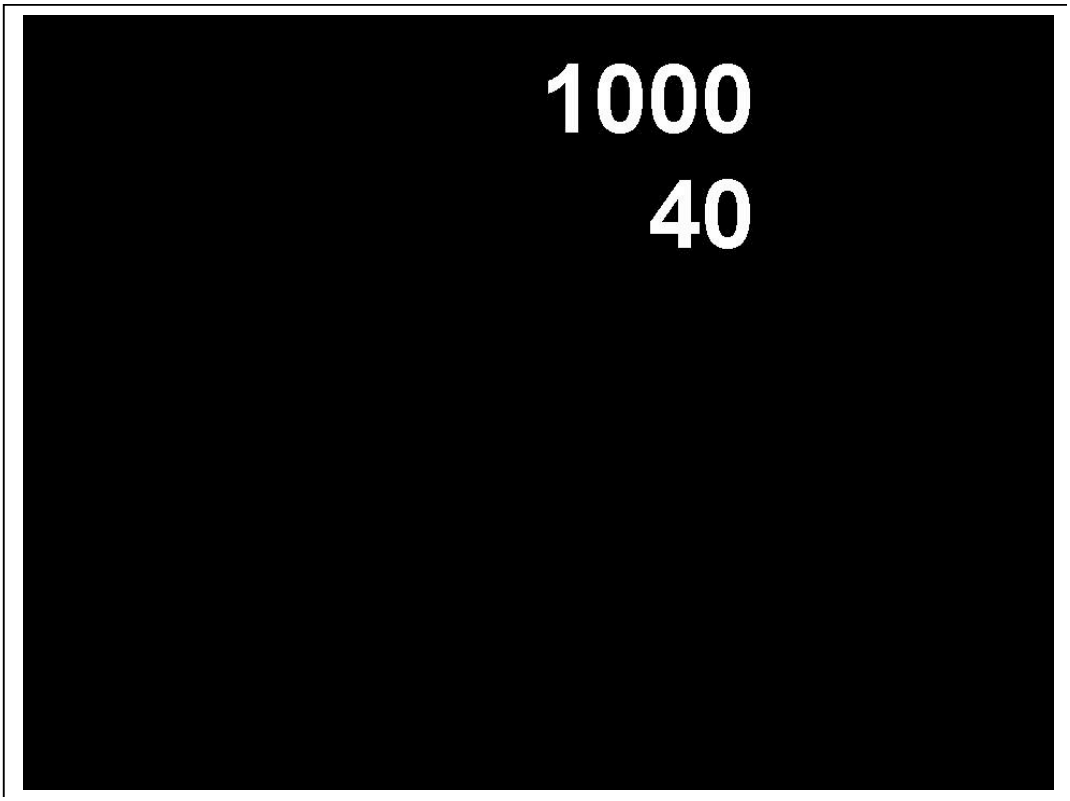
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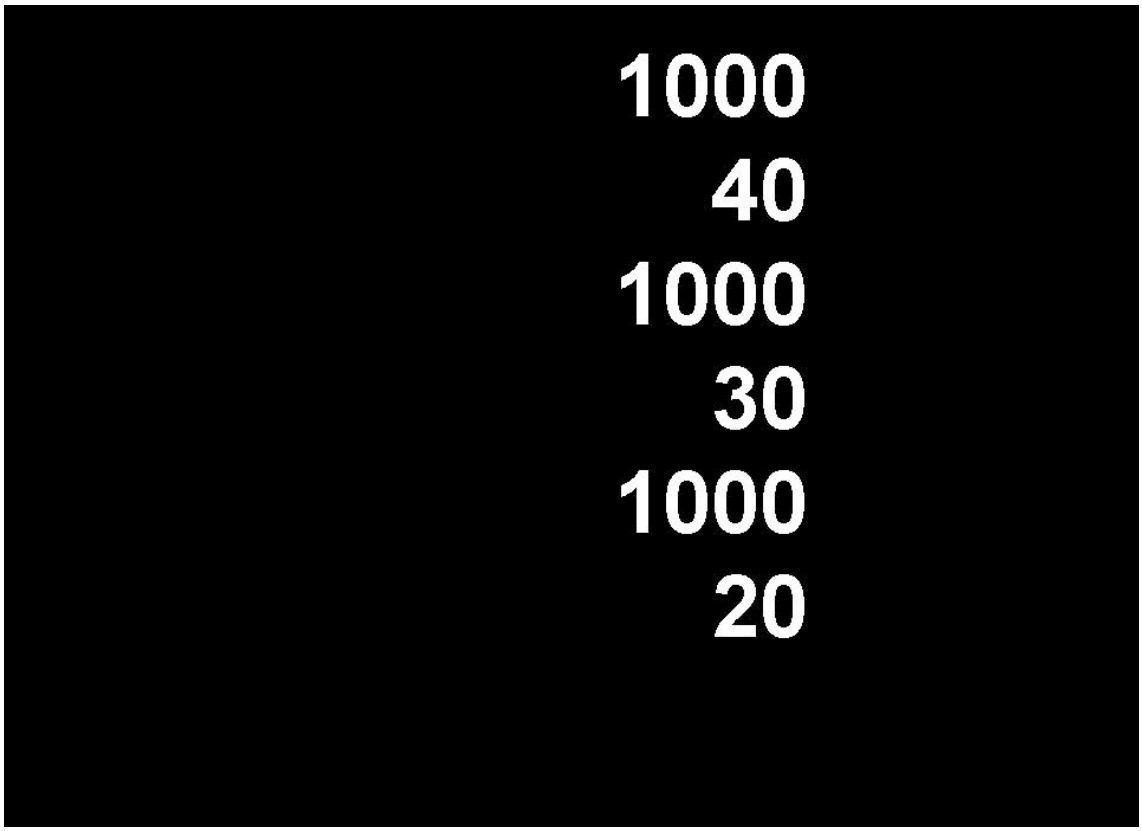
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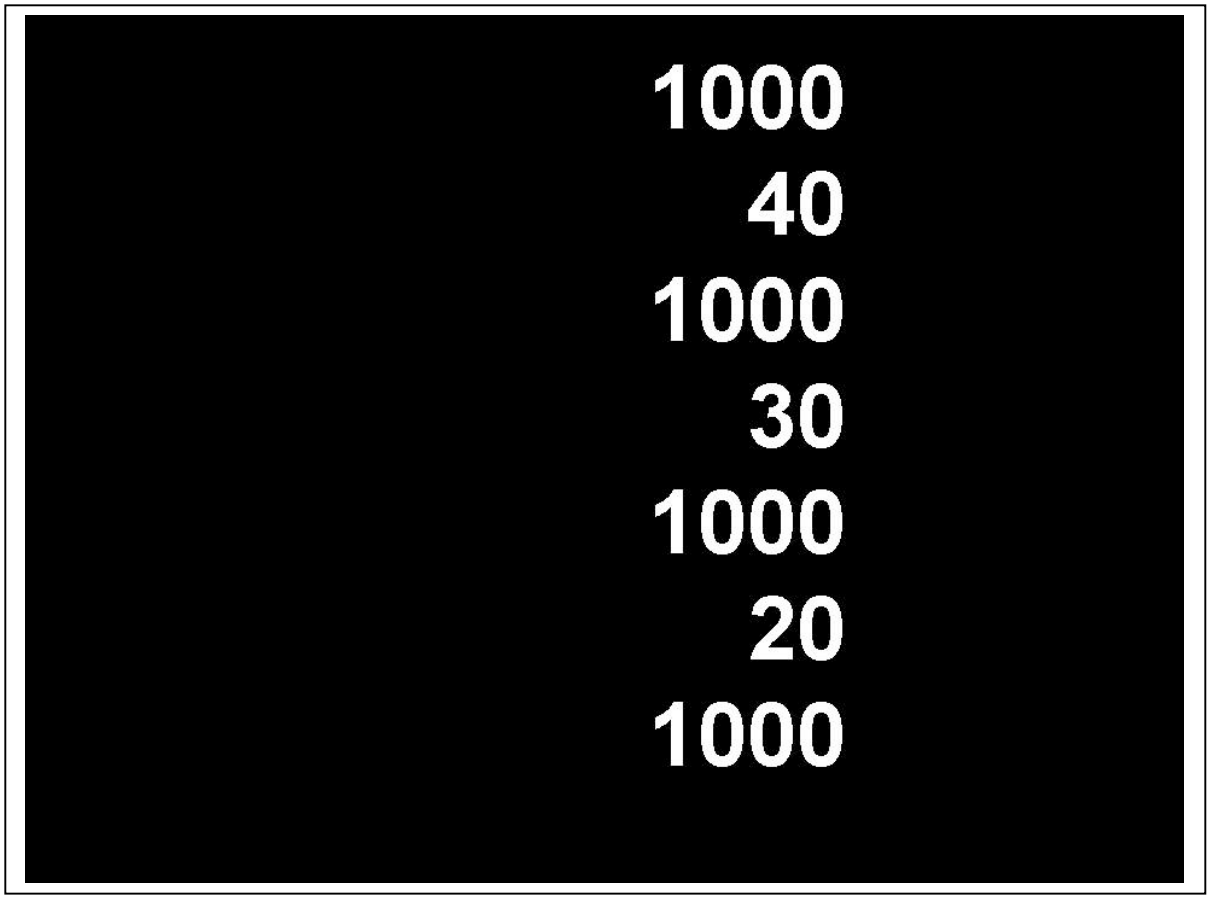
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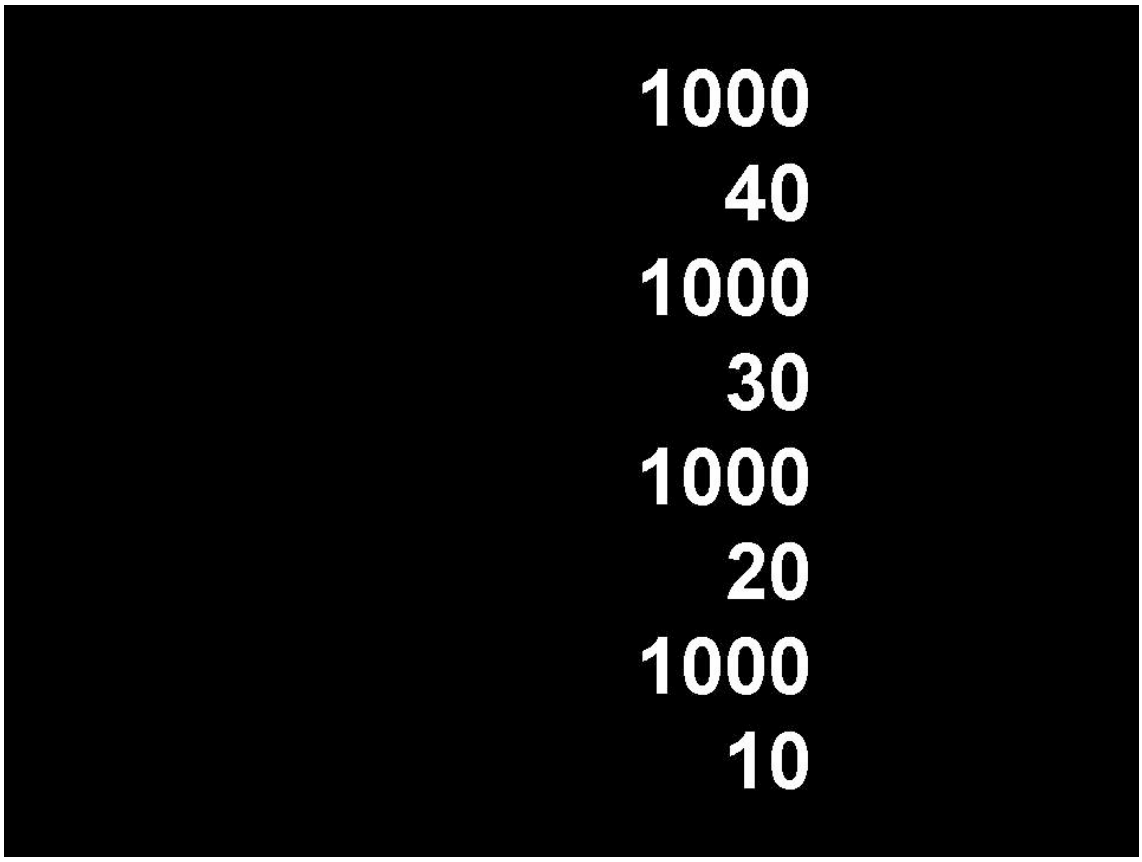
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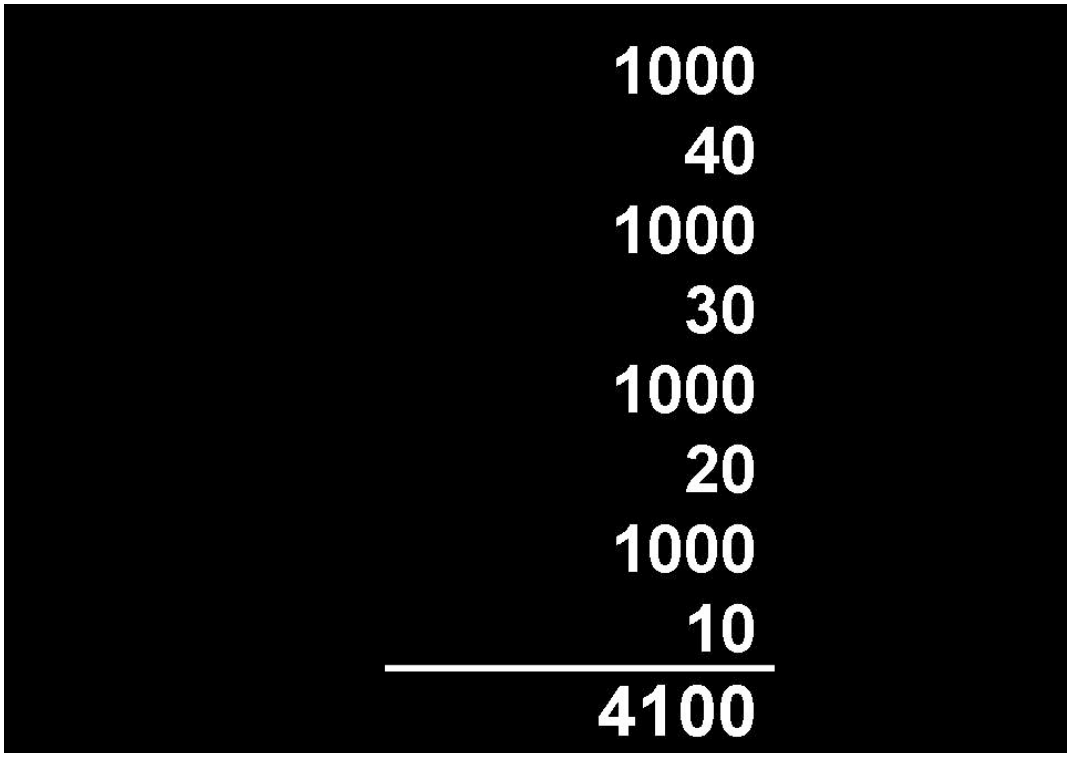


CREATIVITY

IS

MAKING NOVEL

AND USEFUL ASSOCIATIONS

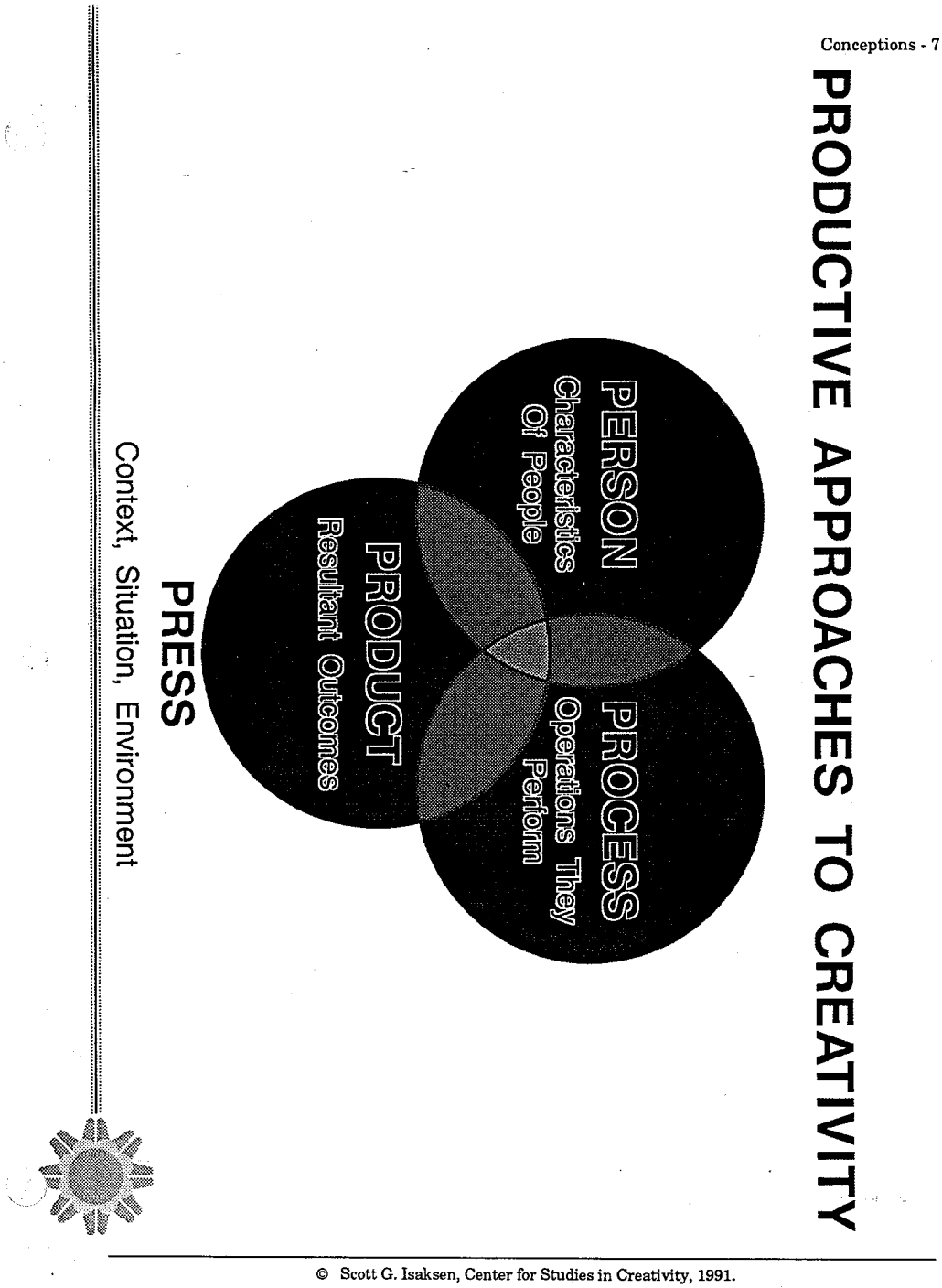
Handouts

Workshop in Creative Problem Solving (CPS) tools and techniques

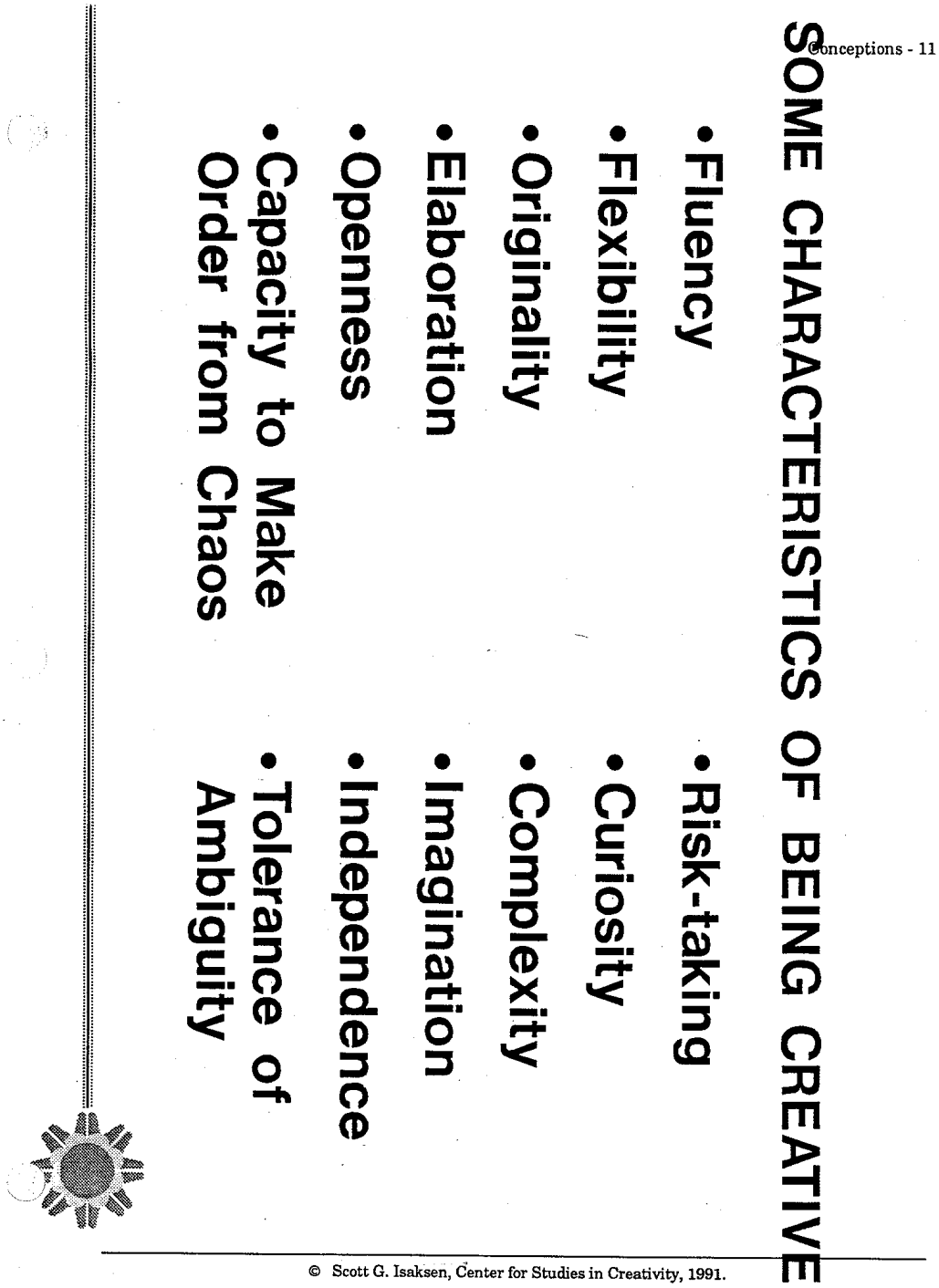
Presented to The KDS Middle School

Presented by: Paul Guthart
Graduate student, International Center for Studies in Creativity, State University of New York, College at Buffalo.

THE INTERNATIONAL CENTER FOR STUDIES IN CREATIVITY
The International Center for Studies in Creativity at Buffalo State College credentials creativity through a diverse menu of programs that cultivates skills in creative thinking, innovative leadership practices and problem solving techniques. ICSC, through the process of creative thought, enhances an individuals ability to imagine new ideas, by learning how to envision that which can't be immediately seen.


Conceptions - 7
PRODUCTIVE APPROACHES TO CREATIVITY
PERSON
Characteristics
Of People
PROCESS
Operations They
Perform
PRODUCT
Resultant Outcomes
PRESS
Context, Situation, Environment
© Scott G. Isaksen, Center for Studies in Creativity, 1991.

Conceptions - 10
0 1 2 3 4 5 6 7 8 9
A rock
Copernicus, Picasso, Einstein,
Curie, Carver, etc.
How Creative
Are You?
© Scott G. Isaksen, Center for Studies in Creativity, 1991.


Conceptions - 11
SOME CHARACTERISTICS OF BEING CREATIVE
• Fluency
• Flexibility
• Originality
• Elaboration
• Openness
• Capacity to Make Order from Chaos
• Risk-taking
• Curiosity
• Complexity
• Imagination
• Independence
• Tolerance of Ambiguity
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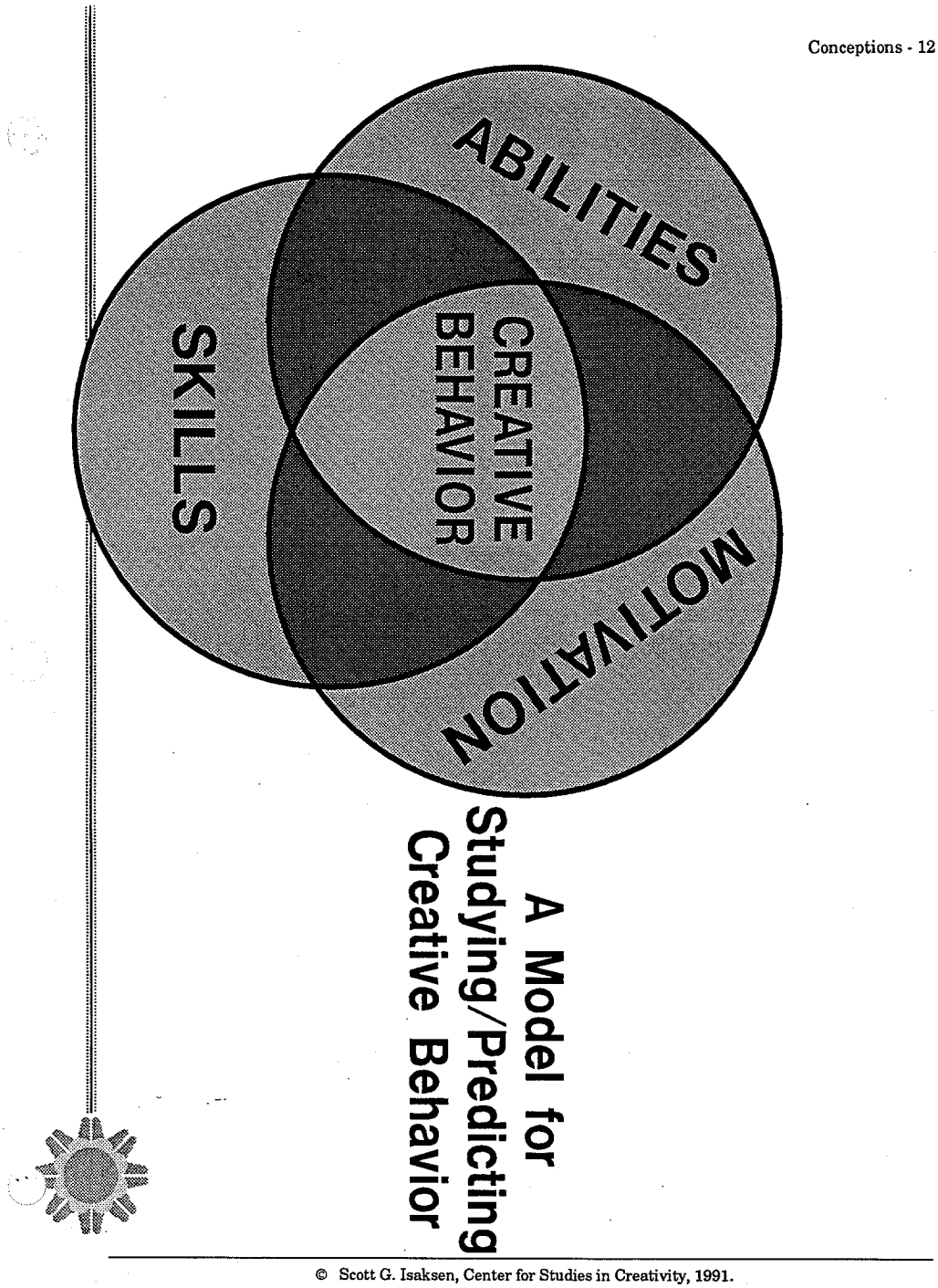
Conceptions - 12
ABILITIES
SKILLS
MOTIVATION
CREATIVE BEHAVIOR
A Model for Studying/Predicting Creative Behavior
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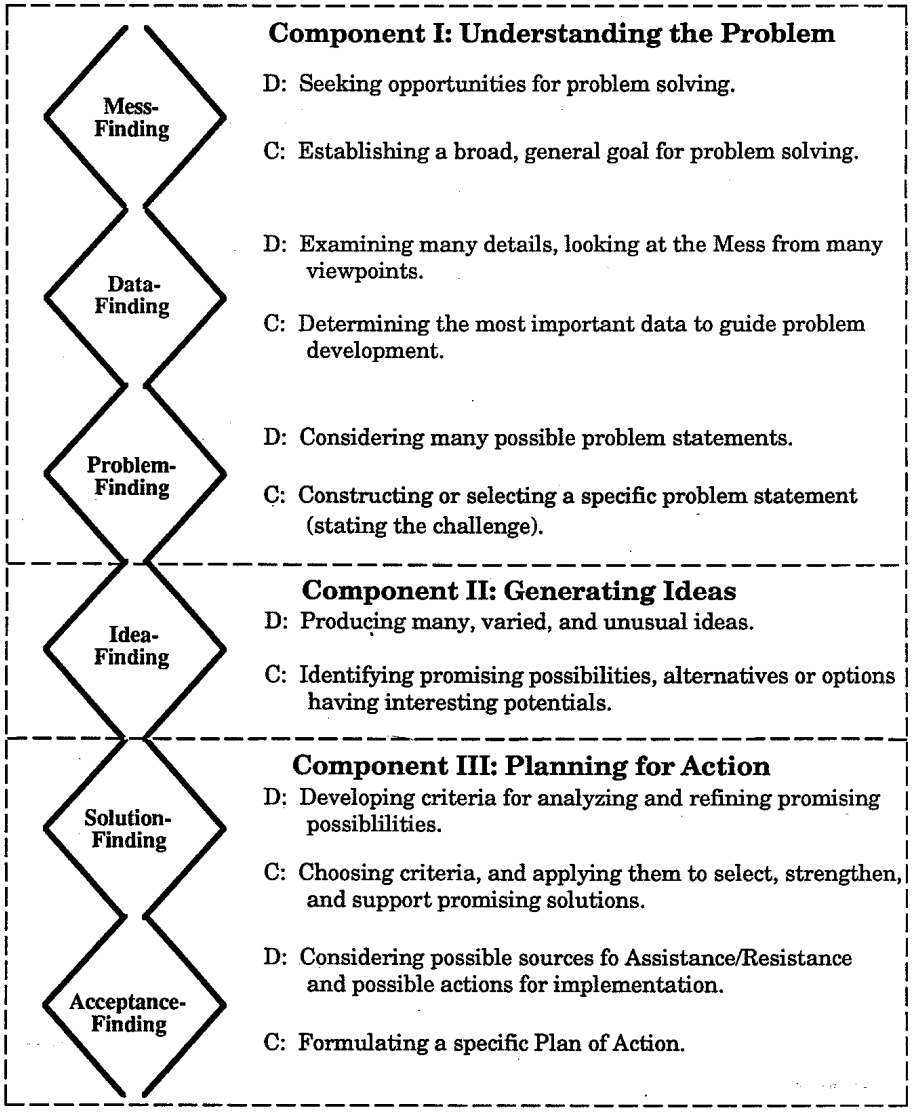
CPS Process - 3

CREATIVE PROBLEM SOLVING:
THREE MAIN COMPONENTS AND SIX SPECIFIC STAGES



Climate - 2

MAKERS AND BREAKERS
Worksheet

• VERBAL BREAKERS: Identify the things people have **said** to kill, squelch, destroy, put down, or inhibit the development of new ideas.

• NON-VERBAL BREAKERS: Identify the things people have **done** which kill, squelch, destroy, put down, or inhibit the development of new ideas.

• VERBAL MAKERS: Identify the things people have **said** to support, build, develop, encourage, or promote the sharing of new ideas.

• NON-VERBAL MAKERS: Identify the things people have **done** to support, build, develop, encourage, or promote the sharing of new ideas.

Climate - 3

101 WAYS TO SAY "VERY GOOD"

1. You're right!
2. Good Work!
3. Well done.
4. You did a lot of work today!
5. It's a pleasure to work with you.
6. Now you have it.
7. Fine job!
8. That's right!
9. Neat!
10. Super!
11. Nice going.
12. That's coming along nicely.
13. That's great!
14. You did it that time!
15. Fantastic!
16. Terrific!
17. Good for you!
18. You out did yourself.
19. That's better.
20. Excellent!
21. That's good.
22. Good job (name).
23. That's your best work yet.
24. Good going.
25. That's really nice.
26. WOW!
27. Keep up the good work.
28. Outstanding!
29. Much better.
30. Good for you!
31. You're really talented.
32. Good thinking.
33. Exactly right!
34. You make it look easy.
35. I'v never seen anyone do it better.
36. You're doing much better today.
37. Way to go.
38. Superb!
39. You're getting better every day.
40. You're right on target.
41. I knew you could do it.
42. Wonderful!
43. You're great!
44. Beautiful work!
45. You've worked hard.
46. That's the way!
47. Keep trying.
48. That's it.
49. Nothing can stop you now.
50. You're very good at that.
51. You're learning fast.
52. You certainly did well today.
53. I'm happy to see you working like that.
54. Keep it up!
55. I'm proud of you.
56. That's the way.
57. You're learning a lot.
58. That's better than ever.
59. Quite nice.
60. You've figured it all out.
61. Perfect!
62. Fine!
63. Your brain is in gear today.
64. You've got it.
65. You figured that out fast.
66. Very resourceful.
67. You are really improving.
68. Look at you go.
69. You've really got that down pat.
70. Tremendous!
71. I like that.
72. I could not do better myself.
73. Now that is what I call a fine job.
74. You did that very well.
75. Impressive!
76. Sharp!
77. Right on!
78. That's wonderful.
79. You mastered that in no time.
80. How nice.
81. Congratulations!
82. That was first class work.
83. Sensational.
84. RIGHT!
85. You don't miss a thing.
86. You make my job fun.
87. You must have been practicing it.
88. I'm glad I assigned this to you.
89. You came through again.
90. DYNAMITE!
91. I knew I could count on you.
92. You deserve a raise.
93. How can I help you with this?
94. Go for it!
95. You bring sunshine into my life.
96. You have my complete support.
97. MARVELOUS!
98. Clever idea.
99. You are really on the ball.
100. I am glad you are on our team.
101. I love your work.

Climate - 4

HOW TO SQUELCH IDEAS

1. We've never done it that way before...
2. It won't work...
3. We haven't the time...
4. We haven't the manpower...
5. It's not in the budget...
6. We've tried that before...
7. We're not ready for it yet...
8. All right in theory, but can you putit into practice?
9. Too academic...
10. What will the customers think?
11. Somebody would have suggested that before if it were any good...
12. Too modern...
13. Too old-fashioned...
14. Let's discuss it at some other time...
15. You don't understand our problem...
16. We're too small for that...
17. We're too big for that...
18. We have too many projects now...
19. Let's make a market research test first...
20. It has been the same for twenty years so it must be good...
21. What bubblehead thought that up?
22. I just know it won't work...
23. Let's form a committee...
24. Let's think it over for a while and watch developments...
25. That's not our problem...
26. Production won't accept it...
27. They'll think we're long-haired...
28. Engineering can't do it...
29. Won't work in my territory...
30. Customers won't stand for it...
31. You'll never sell that to management...
32. Don't move too fast...
33. Why something new? Our sales are still going up...
34. Let's wait and see...
35. The union will scream...
36. Here we go again...
36. Let's put it in writing...
37. I don't see the connection...
38. Won't work in our industry...
39. We can't do it under the regulations...
40. Nuts...
41. Political dynamite...
42. Sounds good but I don't think it will work...
43. It's not the plan...
44. No regulations covering it...
45. We've never used that approach before...
46. It's not in the manual...

Can you think of others...

-
-
-
-
-
-
-
-

Actions that **encourage** speculation/ creativity (synectics)

Listen
Paraphrase
Stay loose until rigor counts
Protect vulnerable beginnings
Take on faith
Temporarily suspend disbelief
Assume it can be done
Share the burden of proof
Connect with
Accept
Be open to
Join
Build on
Speculate along with
Share the risk
Set up win/wins
Make it a "no lose"
Support confusion/uncertainty
Acknowledge
Credit
Value learning from mistakes
Be attentive
Be interested
Show approval
Give early support
Eliminate status/rank
Be optimistic
See the value in
Focus on what is going for the idea
Assume valuable implications
Take responsibility for understanding
Waste no energy evaluating early
Jump to favorable conclusions
Use ambiguity
Give up all rights to punish or discipline

Actions that **discourage** speculation/ creativity (synectics)

Be pessimistic
Preach/moralize
Be judgmental
Assume no value
Make no connections
Put the burden of proof on other person
Take ball away from
Ask questions
Cross examine
Give no feedback
Be noncommital
Put on a stone-face
Be critical
Disapprove
Be impatient
Nitpick
Interrupt
Be bored
Misunderstand
Be inattentive
Act distant
Pull rank
Get angry
Disagree
Argue
Challenge
React negatively
Discount/put down
Be cynical/skeptical
Insist on early precision
Point out flaws
Correct
Name call
Blame
Set up win/lose
Be competitive
Make fun of
Be dominant
Command
Order
Direct
Threaten/warn
Demand
Do not listen
Do not join
Use silence against
Scare

CPS Process - 14

CREATIVE PROBLEM SOLVING RELIES UPON

Making and Communicating Meaningful New Connections to:

- Think of many possibilities;
- Think and experience in various ways and use different points of view;
- Provide depth and detail to new ideas; and
- Think of new and unusual possibilities;

* * * **AND** * * *

Analyzing and Developing Possibilities to:

- Compare and contrast many ideas;
- Improve and refine promising alternatives;
- Screen, select and support ideas;
- Make effective decisions and judgements; and
- Provide a sound foundation for effective action.

Component I - 8

REDEFINING THE "PROBLEM"

- Components of a good problem statement:
  - An invitational stem (How to... How might... IWWM...)
  - Owner (Who?)
  - Verb (Do?)
  - Action (What?)

  Example: In what ways might (IWWM) the guards control Vernon?

- When clientship is clear, use "How to" (H_2).

- If statement is too fuzzy or broad, ask "How?"

- If statement is too focused or narrow, ask "Why?"

- To generate more problem statements, ask "Why else?" or "How else?"

Component I - 10

SAMPLE PROBLEM STATEMENTS

The following problem statements are samples of the kinds of opportunities upon which participants often chose to focus.

Person

- IWWMI motivate my students' learning?
- H_2 prioritize the use of my work time?
- H_2 increase my contributions to my team?
- H_2 get clients to consult with me earlier?
- blanket?
- H2 create and maintain effective teams?

Product

- H_2 develop a new consumer product?
- H_2 build the ultimate service contract?
- H_2 convey product improvements to consumers?
- H_2 improve the controls in an electric
- H_2 plan the perfect party?

Process

- H_2 create a team vision?
- IWWM we move projects ahead?
- H_2 have a team develop a production schedule?
- H_2 be more productive?
- HMI develop my own creativity?

Press

- HM we make meetings more productive?
- H_2 organize my division to be more creative?
- IWWMI remove sexism from my work place?
- H_2 get organizations to work well together?
- H_2 make time for developing ideas?

Other

- IWWMI improve interaction with management?
- H_2 measure impact on sales volume?
- Names for new products?
- H_2 develop an on-going training program?
- HMI improve my relationships?

Component I - 10

SAMPLE PROBLEM STATEMENTS

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- H_2 increase my contributions to my team?
- H_2 get clients to consult with me earlier?
- blanket?
- H2 create and maintain effective teams?

Product

- H_2 develop a new consumer product?
- H_2 build the ultimate service contract?
- H_2 convey product improvements to consumers?
- H_2 improve the controls in an electric
- H_2 plan the perfect party?

Process

- H_2 create a team vision?
- IWWM we move projects ahead?
- H_2 have a team develop a production schedule?
- H_2 be more productive?
- HMI develop my own creativity?

Press

- HM we make meetings more productive?
- H_2 organize my division to be more creative?
- IWWMI remove sexism from my work place?
- H_2 get organizations to work well together?
- H_2 make time for developing ideas?

Other

- IWWMI improve interaction with management?
- H_2 measure impact on sales volume?
- Names for new products?
- H_2 develop an on-going training program?
- HMI improve my relationships?

Component II - 8

QUALITIES TO CONSIDER WHEN GENERATING IDEAS

Fluency

- The ability to generate many ideas
- The focus is on a large quantity of ideas
- Sample tools
  - brainstorming
  - brainwriting (many variations and associations)

Flexibility

- The ability to generate many different categories of ideas
- The focus is on having different types of ideas
- Sample tools
  - checklists
  - scamper
  - attribute listing

Originality

- The ability to generate novel associations
- The focus is on generating unique options
- Sample tools
  - forcing relationships
  - analogy
  - visually identifying relationships

Elaboration

- The ability to provide much depth & detail to ideas
- The focus is on 'fleshing out' an option
- Sample tools
  - in & out listening
  - idea systems
  - imagery
  - reflective idea finding
  - socio-drama

Component II - 9

TARGETING IDEA GENERATION

On the basis of research done by Gryskiewicz (1980), of the Center for Creative Leadership, it is possible to select specific idea-generating techniques to provide particular outcomes.

Brainwriting **Brainstorming** **Visually Identifying Relationships**

ADAPTIVE ——— **INNOVATIVE**

Idea-Generating Qualities

- **Fluency**
- **Flexibility**
- **Originality**
- **Elaboration**

Categories of Idea Generation

ADAPTIVE	Category One:	**Direct** - Ideas generated answer the problem statement directly.
	Category Two:	**Supplementary** - Ideas generated involve a new use, application or "build" on the traditional ideas.
	Category Three:	**Modification** - Ideas generated involve a structural (or more significant) change from the traditional ideas.
INNOVATIVE	Category Four:	**Tangential** - Ideas involve entirely different uses or applications than those from other categories; a real 'shift' in perspective.

Component II - 3

ALEX OSBORN'S CHECKLIST FOR GENERATING OPTIONS

SCAMPER

Substitute? Who else? What else? Other ingredients? Other material? Other process? Other power? Other place? Other approach? Other tone of voice?

Combine? How about a blend? An alloy? An assortment? An ensemble? Combine units? Combine purposes? Combine appeals? Combine ideas?

Adapt? What else is like this? What other idea does this suggest? Does past offer parallel? What could I copy? Whom could I emulate?

Modify? Magnify? What to add? Minify? What to subtract? New twist? Change meaning, color, motion, sound, order, form, shape? Greater frequency? Stronger? Longer? Omit? Streamline? Split up?

Put to other uses? Could its form, weight, or structure suggest another use? New ways to use? Other uses if modified? Change the context?

Eliminate? Suppose we leave this out? Fewer parts? Condensed? Lower? Shorter? Lighter? Understate? How can we make less more? What can we do without?

Rearrange? Reverse? Turn it upside down? How about opposites? Reverse roles? Turn tables? Interchange components? Other sequence? Change pace? Change schedule? Transpose cause and effect?

Sources

Osborn, A. F. (1979). *Applied Imagination: Principles and procedures of creative problem-solving.* NY: Scribners.

Eberle, R. F. (1972). *Scamper: Games for imagination development.* East Aurora, NY: DOK.

Component II - 3

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DIRECTIONS FOR HIGHLIGHTING

When a large number of options exist to choose from it is often helpful to compress the broad array down to their basic categories. Highlighting is a technique used to condense larger numbers of options down to a more meaningful and managable size. The following more detailed directions provide more assistance for applying this technique.

Find the Hits

The first step in the highlighting procedure is to identify the most promising or appealing options. These are called Hits. The following example includes a sample of hits taken from a list of 50 problem statements. The example is taken from a new laundry product which is very concentrated, environmentally safe and comes in an economy size box. This means that consumers only buy about two boxes a year. The challenge with the product is that the lid is not standing up to the use and there are many consumer complaints. As you can see, twelve were chosen as possible breakthroughs, insights or worthwhile directions.

1. How to reduce consumer comments about envirosafe package quality?
2. How to improve envirosafe package quality?
3. How to package envirosafe in smaller boxes?
4. How to change envirosafe package design?
5. How to provide reusable spouts to use on envirosafe?
6. How to make a problem-free box for envirosafe?
7. How to improve envirosafe's recloseable lid?
8. How to package with two reclosable lids?
9. How to make happier soap buyers?
10. How to reinforce reclosable lid on envirosafe?
11. How to send a rebate when box lid breaks?
12. How to have positive consumer comments about envirosafe package?

Please note: Although this example applies the highlighting procedure within Problem-Finding you may use this tool anywhere along the CPS process when a large number of options need to be narrowed down to a more manageable number while retaining the essential character of all the options. You may also use parts of this tool rather than feeling as though it is essential to use all the steps. For example, you may wish to stop after simply identifying hits or placing them into categories.

Component I - 11

AN OPTION "HITS" YOU FOR ANY OF THESE REASONS:

- On target
- Feels right
- Relevant
- Interesting
- Clear
- "Sparkles"
- Intriguing
- Fascinating
- Workable
- Solves problem
- Goes in the right direction
- Right "on the money"

APPLYING CONVERGENCE

You are converging anytime you are choosing, narrowing down, categorizing, analyzing or developing your options. Application of converging techniques occurs all along the CPS process. The application of these tools becomes much more clear during the **Planning for Action** component of CPS. The following general contingencies can help as you plan your approach to convergence.

Level of ownership

The kind of converging technique you choose to use can depend upon how far the actual ownership for the challenge or concern is distributed. If no one really owns the task, then random choice or voting can be utilized because any large amount of time or energy invested in making deliberate and high-quality choices would be wasted. If you are the "sole client" or owner of the task, then you can make an individual decision about your converging (with some input from others if needed). When you share the ownership of the task with others, you will generally need to invest more energy in developing a consensus regarding your approach to convergence.

The quantity of options

The actual number of options you are examining can also influence the use of converging tools. If you are successful in using the divergent tools of CPS you will very likely generate a large number of options. It would be ineffective to merely "slam on the brakes" and select the one or two winners from a group of over one hundred options toward the end of a meeting. For this reason you may need to spend some time categorizing or sorting your options to get a feel for the results you acquired through the more divergent phases of CPS. If you end up with many possible options, you may find it useful to compress these using highlighting or prioritize them using paired comparison analysis. Having fewer options, you may want to develop them through a matrix or using the ALU technique.

The quality of options

The quality of the available options can influence the approach you take to convergence. Generally, the more novel your options are the more you will need to plan to be affirmative or developmental in your approach. Using converging techniques deliberately and affirmatively helps to stimulate the building and 'fleshing out' of new options. You may also find yourself in a situation where none of the options appears to be workable or usable. Here, the quality of the options may tell you about the choices you may have made earlier in the process. For example, How clear was the problem statement? Do I really have ownership? Did I miss a critical piece of data?

Extra Handouts - 11

ALU TECHNIQUE
Worksheet

Advantages

Identify the strong points, plusses and positive aspects of the new idea.

-
-
-
-
-
-

Limitations

What are the concerns or weak points in the new idea (How to...)?

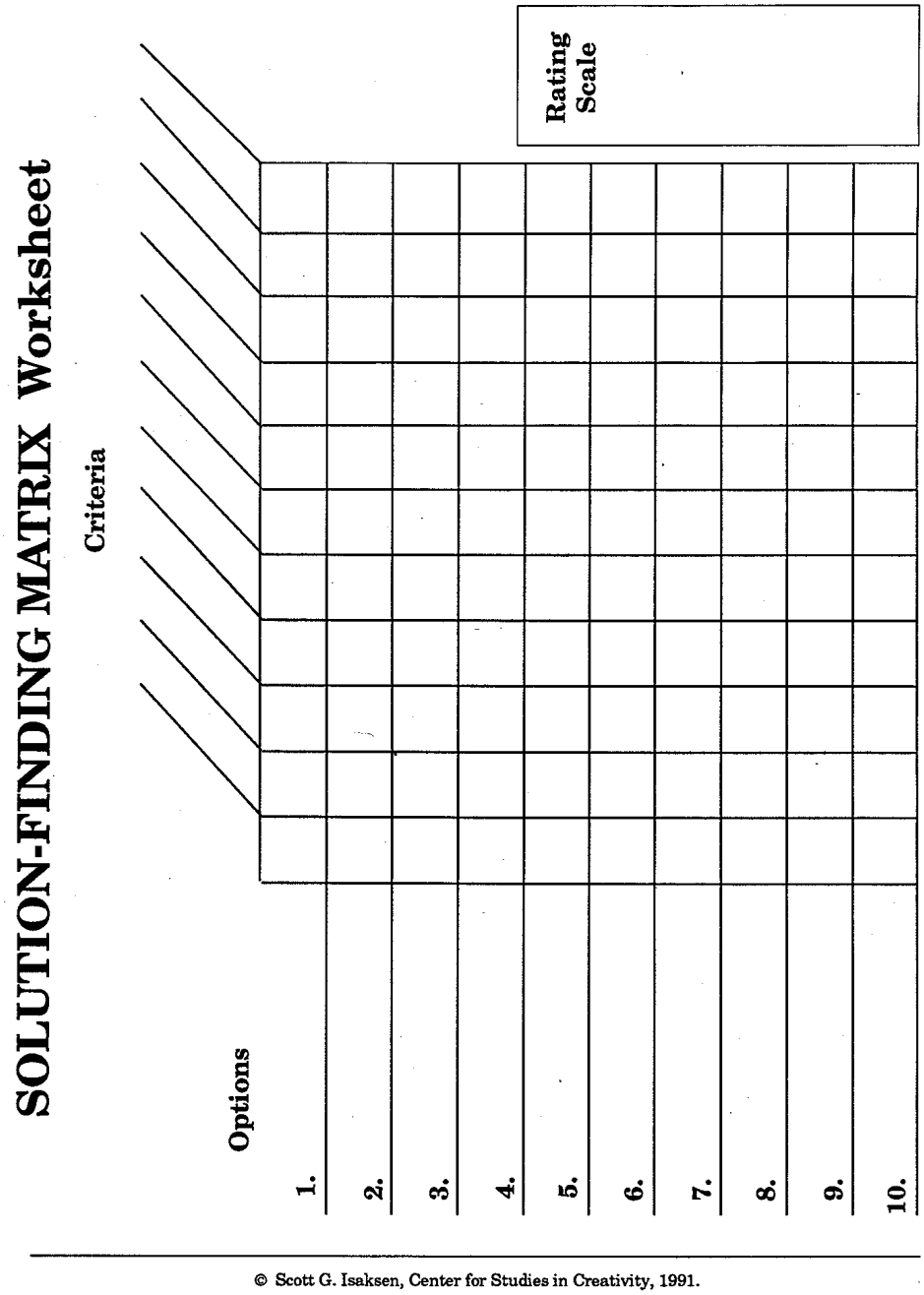
-
-
-
-
-
-

Unique Connections

Identify the new or unusual elements (or possible outcomes) of the idea. Focus on the novel aspects of the option. (What does this idea have that no other idea has?)

-
-
-
-
-
-

Component III - 7



Component III - 17

PLANNING FOR ACCEPTANCE
Worksheet

Promising Solution(s):	

	Sources of Assistance	**Sources of Resistance**
WHO	Helpful people?	Who may limit effectiveness of your plan?
WHAT	Helpful things, objects, or activities?	Things that may impede your progress?
WHERE	Preferred or useful locations or events?	Locations which may be inappropriate?

Component III - 18

WHEN	Appropriate times or situations?	Are there particularly inappropriate times?
WHY	Effective reasons?	Reasons for not accepting your plan?
HOW	Needed actions?	Actions or activities that may be operating against solution(s)?

Component III - 19

PLANNING FOR ACTION Worksheet

Identifying Short, Intermediate and Long-Range Options

1. Consider the sources of assistance and resistance and the specific actions you generated to address the key planning issues. You may want to refer to your "Planning for Acceptance Worksheet."

2. Identify those actions that must be taken in the short term in order to be successful at implementation.

Short term actions are those to be taken by _____

Short-term Actions

-
-
-
-
-
-
-
-
-
-
-
-
-
-

Component III - 21

PLAN OF ACTION
Worksheet

Action **Measure of Success**	**Who** **Start** _____ **Finish** _____ **Where** **Why** **How**

Action **Measure of Success**	**Who** **Start** _____ **Finish** _____ **Where** **Why** **How**

Action **Measure of Success**	**Who** **Start** _____ **Finish** _____ **Where** **Why** **How**

Component III - 22

Action **Measure of Success**	**Who** **Start** ________ **Finish** ________ **Where** **Why** **How**
Action **Measure of Success**	**Who** **Start** ________ **Finish** ________ **Where** **Why** **How**
Action **Measure of Success**	**Who** **Start** ________ **Finish** ________ **Where** **Why** **How**
Action **Measure of Success**	**Who** **Start** ________ **Finish** ________ **Where** **Why** **How**

Concept Paper

Paul Guthart
Masters Project Outline
Teaching Creative Problem Solving Process to
King David School Middle School Students

PURPOSE

The purpose of the project will be to design and deliver a two-day training event where I teach middle school students and teachers the CPS process, divergent and convergent tools, and steps for an action plan. The school I have chosen is the King David School, a Jewish day school located in Scottsdale, Arizona.

Some of the short term objectives I have for the students is to learn and use the basic principles of CPS, divergent and convergent thinking. I also hope that the teachers will incorporate the information, tools and techniques into their classrooms. My long term hope is that the students and teachers will internalize and continue to use the CPS process on other challenges and opportunities.

I plan to have the students learn and understand:

- Divergent tools - brainstorming, forced relationships, SCAMPER, freewheel.
- Convergent tools - hits, evaluation matrix, advantages, limitations, unique connections (ALU) (now called the PPCo)
- Steps for planning for action – taking it forward, identifying short, intermediate and long term options.

I plan to facilitate a CPS process with the students on a problem identified in advance so they can see the process in action. They will see how dynamic and energetic the process is so they can use what they learned in their own groups on day 2.

After a 1 day introduction to the basic tools, techniques and processes surrounding CPS it is my hope to invite several business and non-profit organizations to the 2nd day and have the students facilitate the CPS process on a problem that these organizations would like some creative solutions to. (I will work with the organizations before hand to develop a clear problem statement)

DAY 1

1. Introduction 10-15 minutes– who am I and why am I here. Explain my background and passion for creativity. Introduce the Center for Studies in Creativity.

A. What do we hope to accomplish? – teaching the CPS lite process

    i. Clarifying the problem, generating ideas, develop solutions and implementing action plans. We will do exercises for each of these steps. – Handout CPS lite process.

    ii. Expectations – that you students will be able to facilitate your own problem solving process tomorrow with one of the organizations who have volunteered to have you help them creatively solve a problem.

2. Warm up activity- 20 minutes –
3.
    A. What is creativity? Some discussion with student on this – write answers on chart paper- Slide – Creativity is making novel associations that are useful
    B. Slide – Madness, Mysterious, Magic
    C. Instead we like to view creativity as – Slide – Healthy, Understandable, Natural
    D. Slide- how creative are you?
    E. Number slides – patterned responses – 1000 – 40 – 1000- 30 etc

4. Creative environment – 20 minutes

    A. Makers/breakers- discuss different makers/breakers – verbal and non-verbal
    B. Praise and criticism – how does praise and criticism affect ideas/people?
    C. Habits- how do our habits affect generating and accepting ideas?
    D. Blocks & barriers

        i. Do an exercise with students to list all the words used to squash, kill, mutilate and destroy ideas.
        ii. Then do an exercise to list all the ways people can praise and support good ideas
        iii. Short debrief on this exercise – easier to kill an idea than to encourage it.

Short 5 minute break

5. Introduce the four P's of creativity 15 minutes – Person, Product, Process and Press – Slide – productive approaches to creativity

    A. Discussion with group – what factors/traits are seen in creative people? -

6. Present and discuss the CPS model 45 minutes
   A. Discuss the creative process
      1.Descriptions of:
         i. Clarifying the Problem
         ii. Generating ideas
         iii. Develop solutions
         iv. Implementation plan

   B. Discuss the dynamic balance needed between divergence and convergence. Discuss how each of these tools is important for new and useful solutions to be developed.

      1. Do bathtub exercise with students (Divergent exercise)– breakout into smaller groups of 5-6. Have the group select a person to write ideas down. Stress that the idea writer is a functioning member of the group.

      2. Do 3 rounds of diverging stressing each time to come up with more ideas – introduce forced relationships and SCAMPER, Post-Its as a way to generate many ideas. (handouts)

   C. Short debrief – how did that work? Did you see yourselves stretching and hitchhiking off of each others ideas. How many truly outrageous ideas. Discuss how generating many options and even some crazy ones boil down to useful ideas in the convergent phase of each step.

Lunch -

7. Discuss the benefit of having a clear and properly formatted Problem Statement – 10 min-Wouldn't it be nice if? WIBNI Components of a good problem statement. Owner, action, what? How to refine fuzzy or unclear problems or too broad or narrow – how and why? – Because of our limited time we have already developed clear problem statements for today and in your groups tomorrow.

8. Generating Ideas-10 min– suspend judgment, reach, forced relationships, SCAMPER, Brainstorming bag of tricks. Convergent- finding the hits and hot spots, screen, select and supporting ideas.

9. Review Guidelines for - Developing Solutions– 10 min. Advantages, Limitations, Unique connections (ALU), evaluation matrix (again I would do evaluation matrix here, I think it is a skill they could grasp more easily) (handouts)

10. Review guidelines for Implementing Action Plans – 10 min – Assistors and Resistors, Implementation plan – short term (24 hours) long term (plan of action worksheet)

Break 5 min

10. Conduct sample CPS process with me as facilitator 45min – 1 hour – chose 2 students to help log ideas.
    Choose faculty or staff ahead of time with challenge they want to use CPS on – This will give students opportunity to see what they will do tomorrow.

Break 5 min

11. Debrief CPS session 15- 20 min– What questions, concerns, comments do the students/teachers have. Does anything need to be reviewed? Discuss what tools and techniques they felt generated the best ideas. What might we have done differently?

12. Prepare for students ½ day CPS session – choose teams and facilitators, idea loggers. Bring divergent bag of tricks for groups. Give facilitators a guide sheet of the process to aid them in their own sessions. Go over facilitators Introduce the organizations/people that will be in attendance and share nature of problems to be solved.

Day 2

The purpose of this day is to have the students apply what they have learned about the CPS process, tools and techniques to conduct a real CPS session with a real problem introduced by an organization in the community. A clear problem statement will already be formulated in order for the students to concentrate on assisting client with useful and novel ideas. We will also introduce the process and CPS tools to our "clients".

It is my goal that the students will be able to facilitate the CPS process with a "client" on a real problem and help generate some useful ideas for the client to form a viable action plan. I intend to have teachers from the school present at the program and also invite former creative studies students living in Phoenix to assist the students with their sessions.

Introductions and warm ups – 20 min

13. Introduction of groups to students

14. Warm up activity Introduction of names with an adjective i.e.; poetic Paul

15. Imaginary ball to learn names- I toss an imaginary ball while speaking the name of the person I am throwing it to- they in turn toss the imaginary ball to another person and say their name
16. Introduce the CPS lite process to our "clients".

17. Go over rules for divergent and convergent thinking.

18. Breakout into CPS groups (4-5 groups depending on number of students and those willing to facilitate. Every student will be a contributing member to the "clients" team.

Each group will go through the steps of Generating Ideas, Developing Solutions and assisting client in developing an action plan.

19. Generating ideas – 15-20 minutes
    Student facilitators and participants will use tools learned the previous day to help generate many novel and useful ideas for the client. SCAMPER, Forced relationships, brainstorming.

20. Developing solutions – 15- 20 minutes
    The student facilitators will introduce convergent tools to the client for evaluating ideas. Advantages, Limitations, Unique connections (ALU), evaluation matrix– (handouts)
    This will give the clients some feasible ideas to work with in the Implementation process.

21. Implementing Actions – 15- 20 min

    Students will assist clients in formulating immediate steps to get the selected ideas into action. Short term and long term actions.

Teachers, I and hopefully some former CPS students will monitor each group's process and be a resource to ensure the process moves smoothly for all groups.

Break – 10 min

22. Debrief – 15- 20 minutes

We will come back into 1 group and debrief the CPS sessions the students conducted.

Did the clients come away with some feasible implementation plans?
What benefits do they see in the creative process for solving problems?
Questions, Comments, Concerns?

Thank you's