

Creativity Course Outline

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This course is about exposing students to creative ideas and creative people and encouraging them to try a number of creativity methods to enhance their own creativity through study and practice. Many people think that creativity belongs to highly intelligent people who generate new ideas. That is definitely not so. We are all creative and need to have average intelligence to develop this talent. We need to supplement our thinking with innovation, problem solving, and a critical review process. Having a focus, a sense of humor with minimum inhibition but with the responsibility to improve, is a key part of the creative process. We need to learn to improve and change those approaches that have been thought to be the confirmed style of doing things. We need to learn about brainstorming, synectics, morphological analysis and prioritization and synthesis to improve our approach to creativity. There is no prerequisite for this course except for open mindedness and willingness to be devilish at thinking, innovating and looking for challenges as opportunities.

Challenge, so essential for creativity, is stimulation in the presence of difficulties and obstacles. If one wants to be creative, one must look for and take up challenge as an opportunity. Surmounting challenges is a great gift for making progress. A challenge is a motivator of ideas. When a challenge is strong but manageable, the likelihood of successful accomplishment is high. This presentation will include ideas, examples and humor to challenge creative thinking and problem solving. They are taken from the core of the speaker's course lectures and book, *Creative Thinking, Problem Solving & Decision Making*, and will serve as an introduction to developing one's own creativity and problem solving skills.

A request from the class about helping creativity: for the duration of this course: try to be positive all the time and avoid being judgmental and critical. Be open minded and receptive to new ideas. If you get bored, invent an object or a process, write a poem or an essay, paint or draw a picture, try to pontificate about how to be creative and ask for the opportunity to show or demonstrate to the rest of us. You are free to try anything innovative of your own making. That is the spirit of the class. The requirement is that you must do something.

It is far better to get people to be creative by doing things than by philosophizing about creativity. The latter not only gets boring, tiring and mundane, but also can damage the listener's interest in ever again being accessible to learn about creativity. If one must philosophize, one must be enthusiastic and inspirational in discussing the subject. Of all things, learning about creativity should not be boring.

Are you a collector of anything? If not, start by collecting something you have wanted to have and to care for. Caring and passion are important aspects of creativity and are

incentives for nurturing it. One does not have to collect objects. It can be ideas, jokes, poems, different kinds of peanuts or melons.

There has never been a magician or human oracle who is so universally creative that he or she could solve any problem or invent a perpetual motion machine (not possible according to physics laws) by making a quick guess. Every problem needs some hard work to get a satisfactory solution. We see then that time is necessary to be creative. It is also true that not even lots of time makes it possible for anyone to create a solution to a specialized problem. Study and thinking are necessary. We have to brainstorm, think, analyze and synthesize. It helps to have imagination and experience. We need a practical sense of what needs to be done and lots of wisdom about how best to approach a problem. We get wisdom from weighing things to determine the best approach. In other words we have to be good decision makers.

Personal Qualities to be Cultivated

Creativity needs persistence at any price, any inconvenience, any rest and comfort. It needs dedication and mulling over and over and over what one wants to do and how to do and how to fail and try again and again and again. One has to accept the maxim and learn to live by it with self-discipline. Get up and do it, do not postpone. It has to be first on your mind.

Creativity needs openness to possibilities taking risks and thinking that the impossible is possible, in some way, under certain conditions. Creativity needs silent courage, determination and a willingness to pay whatever the price. Creativity needs curiosity to ask questions and find answers over and over. Trial and error, repetition until a measure of success is reached and such a measure usually comes only after continued effort. Creativity needs making sacrifices learning to trade off what is very important for what is not so important, what has high priority and what does not. To succeed at creativity one needs a practical turn of mind to make things work out, perhaps in small steps gradually or as a flash of lightning that illuminates the sky or more like the sun that keeps burning at a steady pace.

How to Stimulate Creativity in Others

Hand on experience, exercises, simulation and learning by doing.

Establish rapport with the students to get them more interested in the ideas.

Give an open ended problem: it may be very simple like how many buildings there are in Pittsburgh or a hard one as how would you solve the problem between Israel and the Palestinians?

Give a task to work out.

Keep them as directionless as possible.

Play games with children like ping-pong and board games to teach discipline.

Reason before them; use thesis antithesis synthesis.

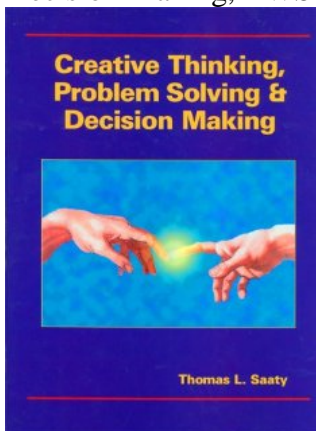
Ask which of many options is best to meet our expectations.

Ask their thoughts and create different possibilities and perspectives.
Challenge them to be open. Can they apply what they know to different situations and how would they use that knowledge?
The Socratic way, ask questions and entertain answers only to ask more questions. Do not give the answer immediately. Ask questions about how things are different today than they were 25 years ago and how they may be in the future. Let them develop their own imagination about the progress of time and knowledge.
Motivate them to work for the greater good of mankind.
Be the devil's advocate and see how they respond.
Talk about personal examples and problems at work and ask others to propose solutions.
Say something challenging and ask them to challenge you back to answer them.
Ask open-ended questions.
Ask them to work in groups to learn from each other.
Ask difficult questions whose answer is beyond knowledge and skill.
Bring every week an interesting article from the literature, the best is chosen by the teacher and distributed for discussion to the class.
Work on a real life project.

Creativity Class Schedule

Seven 3-hour classes, once a week, with a final exhibit of the best that a student can show in the 7th class attended by invited guests and a several thousand dollar prize to distribute to the best performers in creativity as judged by the guests.

Textbook for class at bookstore: T. Saaty, Creative Thinking, Problem Solving & Decision Making, RWS Publications, 4922 Ellsworth Avenue, Pittsburgh, PA 15213,



Creativity Class

1. Welcome to a class that will challenge your talents in a different way than you may be used to. It is likely to be different than other classes you have had. Creativity is a very personal inner talent that we have to nurture with determination for the rest of our lives both through reflection and through will and industrious application. Human beings have a brain and a nervous system that fire electrical signals that are then synthesized mathematically to register all the impressions we get. The result of all nerve activity is either to be excited or inhibited. The ultimate is signals that build up and signals that die

down, this is all that life and thought and creativity produce. We fill in the meaning. Practice habits of creativity any time of the day, reflect on them and talk to friends about them if you feel like it.

2. Please suspend your judgments and negative feelings for the duration of the course as best as you can and for your own sake to become more creative and less critical so you would not inhibit yourself to try new ideas and practices. Open yourself and participate as much as you can. Don't expect a class on creative thinking to be organized step by step to your liking. You need to be mature enough to learn to extract what serves your purpose best. Life is not like a book with a clear start and a happy and conclusive ending. Things don't always work out to our liking. That is the way it is.

3. Put out your names so I can learn to recognize you by name. Also write your name, phone number and e-mail address on a sheet of paper to pass around to everyone.

4. Tell us why you are taking the course and what you expect to learn and what you are willing to invest in this learning.

5. Take the creativity test at the end of the book.

6. Occupy yourself with humor at least for the duration of the course. Send me some good and not so good jokes.

7. Requirements: Home work, quiz about the material in the book every class, short creative contributions you make every day, and a final project of your own choice. Bring scissors to class.

8. During the week, create 3 spontaneous solutions to situations and challenges you meet and write them out for homework to hand in. In that respect, you can do outside class the suggestions on pages 21 and 22 and tell us in writing what you were able to do and how you did it.

9. Try the two horse puzzle by seating the two riders.

10. Do in class the scrambled word exercise 2 on page 23.

11. Don't hesitate to seek help. Come and see me in my office 322 Mervis better in mornings.

12. There is the Brosius Prize in this course for best projects.

13. Your main contribution on which you will be graded is a creative project presented in the last class. **Here are examples of what students won prizes for in the past.**

14. Write down an invention you like to make.

15. You can work in class as a group to develop an idea of your choice.

16. I have been teaching this class for 13 years. I gave the second opening class at Harvard University for 3 hours on the subject. Some student reactions are at the back of the book. I studied at Yale and at the Sorbonne in Paris. I work in mathematics, philosophy, logic and decision making; I coauthored a book in architecture called Compact City, translated to Russian and Japanese, acted in a play on the stage, tried drawing, collector of **all** the recorded works of Beethoven and books written about him; I collect and make up jokes and have written 21 joke books. In a practical way, I paint and repair around the house, make yogurt, build many pieces of furniture, tend a big garden with nearly 1000 tulips and other flowers and cherry trees, teach at a business school, am a member of the National Academy of Engineering and of the Royal Academy of Science of Spain. I have lectured on decision making in most of the important countries of the world. I have developed models on the spread of germs once used by the U.S. military

and as a 19 year old invented an elaborate piano page turner. I served as president and CEO of a corporation involving many scientists, and worked both on disarmament in the State Department and for the military at the Pentagon and taught for 10 years as professor at the Wharton School.

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services (DRS), 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Class 1.

Estimate on a scale of 1-9 (with 9 being the highest), how creative you think you are. Take the creativity test at the end of the book. How well does the outcome match your estimate of your creativity?

Assign project for final class; can choose anything and must present their project at the final class. Show student Matt Duddy's computer-generated video about 96 manhole covers in Pittsburgh around which he built his prize-winning story using powerful sounds. He spent 60 hours on this class project. Also show David Brown's song.

What is creativity? Engage class in a discussion of creativity.

Tell jokes.

Go through the Power Point slides of the short creativity presentation.

Cover the ten points on how to be creative from the slides.

Assign exercises on variations on the 10 points about how to be creative.

- Show the 9-dot video puzzle
- Cup of coffee and cup of milk
- Band around the equator
- Gold bar puzzle: bar to be cut twice to pay a man for each day of the week
- The hats puzzle
- Game show puzzle: the two donkeys and car

Examples of exercises for the class:

1) What is impossible to do but if it were possible, it would change the world in the most fundamental way? Why do you think it is impossible? What is needed to make it possible?

2) Give one example of a person, in business today or in other walks of life, who has changed the world with his/her creative ideas. Go into sufficient detail so we can remember and copy their ways.

3) What are you doing on a daily basis to improve your creativity?

Two examples about the seemingly impossible

- How can we transmit electricity without wires?
- Not an unfamiliar joke about the impossible this time sent to me by Beth Ritchey

THE LUCKY JOKE: This is a joke that should bring you luck.

An elderly woman walked into the Bank of Canada one morning with a purse full of money.

She wanted to open a savings account and insisted on talking to the President of the Bank because, she said, she had a lot of money. After many lengthy discussions (after all, the client is always right), an employee took the elderly woman to the president's office.

The president of the Bank asked her how much she wanted to deposit. She placed her purse on his desk and replied, "\$165,000."

The president was curious and asked her how she had been able to save so much money. The elderly woman replied that she made bets. The president was surprised and asked, "What kind of bets?" The elderly woman replied, "Well, I bet you \$25,000 that your testicles are square." The president started to laugh and told the woman that it was impossible to win a bet like that. The woman never batted an eye. She just looked at the president and said, "Would you like to take my bet?" "Certainly," replied the president. "I bet you \$25,000 that my testicles are not square."

"Done," the elderly woman answered. "But given the amount of money involved, if you don't mind I would like to come back at 10 o'clock tomorrow morning with my lawyer as a witness." "No problem," said the president of the Bank confidently.

That night, the president became very nervous about the bet and spent a long time in front of the mirror examining his testicles, turning them this way and that, checking them over again and again until he was positive that no one could consider his testicles as square and reassuring himself that there was no way he could lose the bet.

The next morning at exactly 10 o'clock the elderly woman arrived at the president's office with her lawyer and acknowledged the \$25,000 bet made the day before that the president's testicles were square.

The president confirmed that the bet was the same as the one made the day before. Then the elderly woman asked him to drop his pants etc. so that she and her lawyer could see

clearly. The president was happy to oblige. The elderly woman came closer so she could see better and asked the president if she could touch them. "Of course," said the president. "Given the amount of money involved, you should be 100% sure." The elderly woman did so with a little smile.

Suddenly the president noticed that the lawyer was banging his head against the wall. He asked the elderly woman why he was doing that and she replied, "Oh, it's probably because I bet him \$100,000 that around 10 o'clock in the morning I would be holding the balls of the President of the Bank of Canada!"

The origin of this Canadian story is unknown but it brings luck to everyone to whom it is sent. Whoever breaks the chain would definitely be unlucky. Do not keep this letter. And do not send money. Just forward it to five of your friends to whom you wish good luck. Something good will happen to you in the next four days. If the chain is not broken, you will have good luck during the four days. Even if all you do is make someone laugh, send it on! If you send this page to more than 5 people, you will have good luck for the next 5 years in addition to the luck you will have within the next 4 days.

Assign the reading of Chapters 1 and 2 from the book and also problems from the end of Chapter 1 to each student.

Class 2.

Can an animal be creative? Give examples.

Can a plant be creative? Give examples.

Can rocks and dirt and water be creative? Would you say that the earth, having given forth all sorts of life forms is creative?

Talk about habits of creativity. What properties of mind and character help one to be creative? What relationship is there between creativity and intelligence and creativity and morality? Can a crook be creative? Can a religious zealot be creative?

Do four aspects of creativity with examples:

- Brainstorming: Do a common exercise to brainstorm, such as how many uses can one make of a cantaloupe? Write them down on the board as fast as they say them.
- Synectics: Connecting things using imagination
- Morphological Analysis: Structuring complexity creatively as an ongoing process
- Prioritization and synthesis

Describe the method of Loci for remembering.

Ask class to do Kirkegaard Puzzle.

Ask class to do A, B, C, D grid puzzle.

Democracy is associated with freedom and laissez faire needed for most kinds of creativity. Democracy is characterized by complicated processes that include electing officials; free, fair and frequent elections; freedom of expression; alternative sources of

information; "associational autonomy"; and inclusive citizenship. It is also related to market capitalism, may hinder it by saving it from its own excesses and in undermining its ability to serve the general good. Capitalism itself both favors and hinders democracy. How is freedom related to creativity, and do they always go hand in hand? Can freedom hinder and stultify creativity? Can there be creativity in an oppressive atmosphere? On the whole, which is better for creativity, freedom or supervision? A little of each, illustrate with examples.

Trees are known to add one additional ring to their bark each year. How is a ring added, from the middle or from the outside? Explain.

Humans do not have a way to sense magnetism. It is the pull of a magnet or its rotation and the attraction or repulsion of magnets that they can feel or see. Mention five other discoveries we have made that have great value and which our bodies are not equipped to detect directly. Now mention five other basically different fantasies of your own which could be a boon to have in our arsenal of increased sensing and expanded understanding. Can the human dimension be extended this way ad infinitum and is it attributable to our ability to synthesize information from our basic senses or to some other latent talent that we have? Can other forms of life extend their sensing and synthesizing in this way and how? Invent a way for a tree to extend its basic biology and enhance its own survival through human technology in a manner that trees cannot do on their own.

Write a one-page report on some book on creativity of your own choosing or just on what you think about what it takes to be creative. After reading chapter 3, bring an invention of your own making to class. Making it is much preferred to talking about making it. It can be simple but tickles the imagination and has the element of originality and novelty in it.

Class 3.

Problem solving

Identify with the class some shared problem. Ask, "Why is it a problem and from whose standpoint? What are some reasons why it is a problem? What are all possible solutions? Which appears to be the best solution? How is it the best? How best can one implement this solution?"

- A) Cube problem
- B) Do the wire around the earth problem
- C) Students do a puzzle together: the 12 coiner problem
- D) Give class 20 minutes to construct the 5 regular polyhedra with whatever they can find around them. They can go outside to do it.
- E) Assign students to write a poem or draw or paint something

Ask students to bring a painting, drawing, poem, essay, joke, musical composition, a dance, a riddle of their own to class next time.

Class 4.

- Students show their art works.
- Estimation example.
- Estimate how many books are in the Library of Congress. Validate your result by getting the real answer.
- Estimate the population of the world.
- Estimate the number of students getting MBAs this year in the U. S.
- Estimate the total amount and average height of ice in Antarctica.
- What percentage of the water on Earth is locked up in Antarctic ice?
- Develop an estimation method so that any person could use it to determine how many calories are consumed in different levels of intensity of exercise, including thinking and sitting in front of a computer.

Class 5.

Multicriteria Decision Making; how to make high-cost high-impact decisions that are reasoned, defensible, and will lead to an organization making a decision having greater success. For students who know the subject well, work on developing and writing about a systematic and workable creative way to help organizations practice decision making as a science without total reliance on the qualitative and not well structured judgments of an executive.

Class 6.

Create a hierarchy of your own goals and criteria and use it to establish priorities for deciding on the best place to live or the best job to choose. For students who did the study of decision making for an organization, present power point slides in class of your ideas.

Class 7 (Final).

Bring your own project whatever it may be to show to the class and to invited guests. Be your own best advocate.