

## A Class in Creative Design

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### 1. Introduction

In the winter quarter of 1995-96 a class named “Creative Design” was introduced. The course had been taught before as a two-credit course but in 1995, it was re-introduced as a four-quarter credit course. When organizing the course it became clear that this would be a “one shot” introduction to creativity. As such, it would be necessary to “sell” the students on the importance of creativity, and if they became excited about creativity, they would have to learn more about creativity on their own. As I think more about this, faculty should try to “sell” more of our courses to our students. For example, whether or not a student likes or dislikes “Thermodynamics” probably has something to do with the professor.

The impetus for expanding the course from two credits to four, was Edward deBono’s book, Serious Creativity. [1] This book has many techniques to use for improving creativity and everyone can try these techniques.

In 1995, another new creativity book, Jump Start Your Brain [2] by Doug Hall, appeared. This book also has a lot of “Brain Programs” to help improve creativity and, in addition, it is a lot more fun to read. Of course, FUN is a good way to get students interested and excited. For the last three years, the course has been taught using Jump Start Your Brain, and the students have liked it a lot and learned a lot as evidenced by the student comments which are listed in Section 6.

### 2. Course Organization

The class is listed as the usual course in the catalog. The catalog description is listed below.

ME 380 Creative Design 4R-0L-4C Pre: Permission of instructor

Emphasis on the creative process in engineering design. Emphasizes the inter-personal and creative processes involved in engineering design. Students will experience and develop their design capability by experiencing various conceptual blocks using creative enhancement techniques and designing and constructing unusual devices.

In an effort to get the students more involved in the class I tried several different techniques. This class is really a discussion class. The students must write daily, one-page memos on handouts and chapters of the two required books. One book is Conceptual Blockbusting [3] by Jim Adams and the other is the aforementioned Jump Start Your Brain. The students keep their memos and add comments about the discussion of the day. By having the memos due every day, each student can usually participate in the discussion. Other reading assignments are some handouts about creativity and personality traits based on papers. [4, 5, 6]

Due to this format, the instructor gives no lectures. Instead the instructor interjects comments and appropriate examples from his background and experience when the students have mentioned something along the same line. In addition to the above activities, there are also design activities, and reading another book on creativity and writing a book report. The book reports are then collected and assembled into a booklet so each student has this booklet to guide his future adventures into creativity land.

The students each present one of the brain programs in their own way. They have to learn about it and then teach the class about that particular program. For example, one of the brain programs is “Kitchen Chemistry”. The students may put ordinary kitchen ingredients together in unusual combinations. This is like the old TV show “McGyver.”

### 3. Grading

The grades are based on the scores for the one-page memos and the book report. There are no tests. The memos are graded on 10 for on time and complete. One day late is 9, two days 8, etc., and after five days late it is only worth 5 points. There are about 27 memos and then the book report is worth 50 points.

### 4. Developing Communication Skills

Although I had not thought of the discussions as being very difficult, one student told me that this had really improved his communication skills. At first, when he had to speak, his mouth got dry and his hands got sweaty. However, after a few weeks he became more comfortable. It is also surprising how much diversity of thought there is in a relatively homogenous class of mostly mechanical engineering majors. The different thoughts feelings and thinking preferences are really exposed in the discussions.

The memo writing is difficult because there are so many and they are every day (almost). However, this is a common form of communication in industry and the students are learning to do it well. The memos are not to state what the book said but what they thought of what the book said and share any personal experiences. This makes the memos interesting for me to read.

### 5. Other Course Activities

A section in Jump Start Your Brain claims that coffee helps you be more creative. At one time Doug Hall even produced his own blend of coffee named “Brain Brew.” To help the students become more creative I started brewing coffee in the department coffee maker and taking two or three pots to class. The students really liked the idea, even if they didn’t like coffee. The nice thing about bringing coffee is that for thirty students for 40 class meetings, it only costs about \$10 to \$15

One day, I brought in doughnuts to go with the coffee. One student said, “This is great, we should do it every day.” My reply was that it would be too expensive. The student then replied “ No, **let us** bring in the refreshments.” Then I sent a sign up sheet around and two or three students signed up for the remainder of the class meetings. The results were amazing. One student had his mother make three breakfast casseroles! It added a lot to the class, which met at 9:00 am., and it really didn’t take very much time away from the discussions.

In practically all courses in industry, refreshments are common. When the doughnuts don't show up at Sunday School, everyone is upset and irritated. Therefore why shouldn't college courses be a little more like courses in industry?

A sidelight to this is that I brought coffee and each day a different student brought refreshment into Thermal Design this fall quarter. Thermal Design is a lecture course with a project, and the refreshments worked great. This class was the first period so the students were glad to have "breakfast" in class. As instructor, you have to encourage them to get up during class and go for an extra doughnut. There were no breakfast casseroles brought into Thermal Design. The change in student response on the course evaluations was amazing! It seemed that the refreshments changed their whole attitude toward the class. They wrote on the evaluations that they learned a lot from the project. Some of the positive comments were from students who don't even like thermo.

The pessimistic view would say that at least on the day that students had to bring refreshments, they were involved in the class. However, I think it created a better learning environment in the classroom.

After I attended the Chautauqua short course "Enhancing Student Success Through a Model Introduction to Engineering Course", I used the "Name Game" as it was practiced at this course. One of the most impressive aspects of the Chautauqua course was the interaction of the participants. A lot of this interaction was due to the use of the name game which introduced nearly everyone to everyone else. Last year I tried this in Creative Design and the students began sharing their thoughts, personal experiences, and feelings the first week. In the past, this level of sharing didn't happen for three to five weeks. It seemed like knowing everyone's name in class created a learning community that was friendly and non-threatening. It seems to me that this is the kind of learning community that is needed and useful. Because the students are all trying to learn the same thing. There is a common goal.

In addition, next quarter I am going to break up the period by having students sign up for a day to bring in a joke or wise saying about creativity. During the middle of the period I will call for "Joke Time." This will also be a useful technique in lecture classes. It will both get the students involved and they will have a short humor break.

## 6. Student Comments

The students have really liked the class as evidenced by their comments on the course evaluation forms. Some of their comments are listed below.

- \* It's amazing how much you can learn when you're having a good time!
- \* This class was excellent. Not only did I learn about creativity, but my learning extends to all of my classes, and future problems.
- \* Great course, this really enhanced the way I look at the world and how I will live my life and solve future problems.
- \* Excellent course, should be taught at freshman level. It's a little difficult to keep up with the reading, but its worth.
- \* Some of the most important lessons have been taught by this class.
- \* I felt that I learned a lot about a subject that has never really been stressed here at Rose. I was impressed with how much this class can teach.

## 7. Conclusion

Sometimes even old dogs can learn new tricks. I have worked really hard in some lecture courses and the student evaluations have not been very high. In this class, the more I tried to get the students involved the more they liked it. Of course the topic is very different and is exciting and is not the same old analytical course they are used to. Although the course seems loose, the class assignments and activities in each class session must be planned at the beginning of the quarter.

The students have been wonderful and creative in this class. For example, my “creative” order of the discussions consisted of clockwise, counter-clockwise, and sort of across. One student said let’s do something different and he came up with at least two hundred ways! Some were shoe size, first letter of your mothers maiden name, first letter of the street you live on, and first letter of your high school mascot.

I think that we must at least let students know that creativity is important and the creative thoughts and ideas should not be stifled. In addition, the students should know some creative enhancement techniques to try in different situations. When all companies can buy the same powerful computers and computer programs, the difference between success and failure will be the resourcefulness & creativity of the employees.

## 8. Bibliography:

- [1] de Bono, E., SERIOUS CREATIVITY: Using the Power of Lateral Thinking to Create New Ideas, HarperCollins Publishers, Inc., New York, NY, 1992
- [2] Hall, Doug, JUMP START YOUR BRAIN: A Proven Method for Increasing Creativity up to 500%! Warner Books, Inc, New York, NY, 1995
- [3] Adams, James, CONCEPTUAL BLOCKBUSTING: A Guide to Better Ideas, Addison Wesley Publishing Company, Inc., Reading, MA, 1990
- [4] Dekker, Don, “Practical Creativity Within the Engineering Design Processes”, International Conference on Engineering Design, 1995, Prague, The Czech Republic, WDK 23
- [5] Dekker, Don, “Psychological Guidelines for Creative Design”, International Conference on Engineering Design, 1983, Copenhagen, Denmark, WDK 10
- [6] Begley, Sharon, “Your Child’s Brain”, NEWSWEEK, 19 February 1996
- [7] Felder, Richard, & Soloman, Barbara, Learning Styles and Strategies, Downloaded from the WWW

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Don, a Professor of Mechanical Engineering, teaches, among other courses, Thermal Design, Internal Combustion Engines, Kinematics, M.E. Laboratory, and Creative Design. He has been active in ASEE and was Zone II Chairman and Chairman of the Design in Engineering Education Division. His Ph.D. is from Stanford(1973), his M.S. from the University of New Mexico(1963) and he earned his B.S. from Rose Polytechnic Institute(1961).