8-25-1995

TEACHING I.S. STUDENTS TO BE MORE CREATIVE

Daniel Couger J.
University of Colorado

Follow this and additional works at: http://aisel.aisnet.org/amcis1995

TEACHING I.S. STUDENTS TO BE MORE CREATIVE

J. Daniel Couger
Distinguished Professor
IS and Management Science
University of Colorado, Colorado Springs

For the first time, creativity content is explicitly included in the joint ACM-AIS-DPMA national IS curriculum recommendations. *IS'95: Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems1* contains specific content on creativity and innovation. In previous reports, that content had been implicit.

Few faculty have had the opportunity to teach creativity concepts and techniques, because few colleges include this material in their curriculum. Enigmatically, over one third of U.S. corporations have formal training programs on this important subject. Nor is it an issue of training versus education; there is solid research in the field, more than 4,000 articles on the subject have been published in just five fields: basic science, engineering, education, psychology and architecture.

There are proven approaches to help individuals improve their creative output. The subject is important if the U.S. is to regain its international leadership position. U.S. business must be more creative than ever before and creative IS organizations are needed to help achieve those results.

Some schools, like ours, have full courses on the subject of creativity/innovation required of IS majors. Others are teaching modules on this topic in various IS courses. With the explicit content in IS'95, other schools will begin teaching this topic. I'll provide a background on the objectives and content, then discuss pedagogy.

Objectives of Education on Creativity

Research shows that, while creativity is normally distributed, all persons can become more creative. The research also indicates that most people demonstrated lots of creativity at age 5, before going to school. The educational system, valuable as it is for imparting knowledge, has stifled creativity. Longitudinal studies of creativity show that students demonstrate progressively less creativity as they advance through the educational system. My 2 major objectives in instruction, therefore are: 1) to review the factors that block creativity and to provide students with approaches to help remove those blocks, and 2) to provide processes to enable them to resurface their innate creativity -- to unleash the creativity that they exhibited at age 5. The research on creativity improvement programs proves that individuals can restore their native creativity and continually improve their creativity.

Framework for Teaching Creativity

The framework of the CPS (Creative Problem Solving) model (shown on the following page) is an ideal approach for teaching creativity. This model evolved from the Scientific Method. It is a systematic approach thus very effective for teaching business students. I've converted the 5-step CPS model to a methodology by providing process. I've identified 22 creativity techniques that enable the CPS model to be operationalized; these proven techniques were transported over from the 5 fields mentioned above, where solid research on creativity has been conducted. As shown in the figure, many of the techniques are useful in more than one phase of the 5-step CPS process.

Even though my books 2 ' 3 use the term CPS, because it is so well known, the method is not limited to problem solving. It is equally useful for opportunity identification. I use same framework for conducting workshops for industry. I've helped introduce creativity improvement programs in a number of IS organizations. As documented in my books, return on investment of 200% to 600% resulted from these programs. Although considered rather esoteric by some individuals, creativity is highly cost-effective. In addition to these high ROI, people are more motivated -- reducing turnover. I also try to demonstrate the value of the CPS process to individuals and teams. Students are assigned projects requiring them to use CPS in their personal activities. Examples of topics they choose to demonstrate the value of CPS are: purchasing an automobile, selecting a spouse, determining the feasibility of obtaining an MBA and changing career fields. Students must also show the results of their use of the techniques in another course taken that semester. Surprisingly, they frequently chose a group exercise even though it requires them to convince their teammates of the advantage of using the creativity technique.

Missing Ingredient in TQM, BPR, and SMT

There is an alarming dropout rate in TQM programs. **Business Week** and **The Wall Street Journal** have reported this problem. A similar problem exists for Business Process Reeningeering. Only 30 percent of BBR projects are successful, according to **Computerworld**. Self managed teams are taking too long to become effective -- up to 3 years, as reported by articles in the behavioral journals.

All 3 of these programs have the same shortcoming. They have excellent tools and techniques for analysis of the existing situation, in order to establish a basis for improvement. But the only technique they recommend for determining improved approaches is Brainstorming. As documented in my books, Brainstorming has been proven to be one of the least effective creativity techniques. For example, Brainwriting has been proven to be 50% more effective and Nominal Group Technique 100% more effective than Brainstorming. Teams should take advantage of the full array of 22 techniques for developing improved approaches, regardless of the program.

However, the common deficiency is not confined to these 3 programs. All company programs can benefit from the full array of creativity techniques.

Full Course on Creativity for IS Majors

I'll discuss the principal differences in the full course on creativity/innovation for IS majors versus the approach of including modules on the topic in several IS courses.

In the first week of the full course, students are divided into teams. For several weeks they work on creative exercises to build team rapport. Then they begin work on the term project. All teams are assigned the same project. Examples are: starting their own software firm, reengineering a major business function, or implementing a new methodology. This project is done during classtime over six weeks. During my lecture time, I guide them through the same steps in another problem common to all students, that of performing successfully in IS employment interviews.

Activities to Stimulate Classroom Creativity

Although students clearly experience the value of CPS for facilitating the creative process, many continue to believe that they are not inherently creative. I help them get through that barrier by brief classroom exercises. The use of unusual and fun-type exercises keeps the creative juices flowing nicely, preparing students for the real-life application of CPS in the latter part of the class that day. Sources like the book "Why Do Clocks Run Clockwise?" provide interesting thought-provokers.

There are number of books containing interesting exercises, useful for the early part of each class. I've listed them in the instructor's manual for each book. An example of these exercises is the forced relationship approach, where they are given a subject unrelated to a problem and are forced to draw some relationships. Example: "Three neighborhood cats of unknown ownership have been serenading you every night at 3 in the morning. You are sick of it...and getting tired too. What can you do about it?" Students are given the following objects to force them to think about relationships, that might lead to solutions they would not have considered without such an approach. Example objects: a candle, a box of peanut brittle, owner's manual for an Edsel, a sailboat. They work with the person sitting next to them in all these exercises, then share the results with the rest of the class. Incidentally, the research has shown that a dyad (2 people) is the most productive group size for creative output. Teams of 5 are the next most productive, so I use that size for the team projects.

Interesting anecdotes help set the tone for the class. I include several each class period. An example is the use of bird feathers to mop up marine oil spills. We all know that waterfowl are a major victim of oil spill; how many of us extend that knowledge to an innovative solution for oil spill cleanup? One person did. Michael Murphy, a lecturer in chemistry at a college in Ireland, showed that feathers absorb 14 times their weight in oil. Peat, the next best natural material, absorbs less than twice its weight. This illustration of creativity comes from "Developments to Watch," published each week in Business Week. This feature of the magazine provides numerous examples appropriate for the course.

I also show transparencies of lots of cartoons. The research shows that laughter releases endorphins that stimulate creativity. Many of us are not good joke tellers but anybody can stimulate laughter with a cartoon. When you start looking for them, you'll be amazed how

many cartoons illustrate principles of creativity. Calvin and Hobbes is a gold mine all by itself. There are also excellent videotapes to use in classes, described in the Instructor's Manual of my books.

Modules on Creativity in Various IS Courses

IS'95 suggests where creativity/innovation topics are best taught in various IS courses. The subject applies to all IS activities -- none are exempt. However, the principles and concepts should be taught in the first semester a major begins his/her IS courses. Thereafter, the various instructors can give examples of application of creativity techniques in the various subject areas within IS. _____ 1. Couger, J.D., Davis, G.B., Gorgone, J.T., Feinstein, D.L. and Longenecker, H.E., *IS'95: Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems,* ACM-AIS-DPMA, 1959.

2. Couger, J.D., *Creative Problem Solving and Opportunity Finding,* Boyd and Fraser, Danvers, MA, 1995.

3. Couger, J.D., *Creativity/Innovation in I.S. Organizations*, Boyd and Fraser, Danvers, MA, 1995.