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Learning to Learn

The Art of Doing Science and Engineering

Session 25: Creativity

Creativity



Underlying Problems:

- Societal and Organizational views of the Value of Creativity
- Differences between:
 - *Creativity, originality and novelty*
- Creative concepts must have "Value," but to whom?
- Can Creativity be "Learned"?

Societal and Organizational views



Large Established Corporations Don't Value Creativity

- Elders wish that things be done as before
- Tradition is important
- Similar to Primitive Societies

But We DO value these traits!

Creativity, originality and novelty



Picking a random number by multiplying two separate random numbers is original, but not creative.

Calculating the biggest prime number is not original, but it is difficult and therefore creative.

Modern Art as Analogy



Anyone can create a work that is new and different, but it won't be great art.

Art changes, and is seldom appreciated when it is created.

It is only afterwards that this great art sells for great sums of money. If it is not widely accepted, it might not be creative.

"The Robert Fulton Complex"



They laughed at Fulton, and they were wrong.

They are laughing at me, so they must be wrong.

(This is an example of specious logic.)

Continental Drift



Early works describing Continental Drift were ignored, until after World War II, when the oceans were observed to be splitting.

The original theorist, Dick, doesn't get the credit, because it wasn't recognized then.

The Synthesis of Creativity



Bringing varied disciplines together in new ways is CREATIVE.

When something is new to one field, but well known in another, and applied to the former, it is CREATIVE.

Demonstrating relatedness is CREATIVE.

Hooks into an Idea



Contemplating ideas from different angles, associations and searching for related applications.

"That which you learn from others, you learn to follow. That which you teach yourself, you learn to lead."

Thinking and Talking about Ideas



Brainstorming doesn't work

Talking about your ideas and problems with your friends DOES work

Seek people who stimulate how you think about your ideas

Dropping Problems



You must be willing to drop bad ideas or problems that seem to be:

- *Wrong problem*
- *At the wrong time*
- *In the wrong way*

Einstein's search for the Unified Theory is the classic example.

Cornered-Rat Theory



Requires a great deal of confidence

Requires self-knowledge

Deliberately promise to deliver solutions under artificial deadlines

Find a way to manage yourself

Limitations



One-armed people are not good jugglers

Youth favors creativity

Age favors wisdom

Elder experts can become coaches