Creativity and Creative Thinking

• What is creativity?
  - Novelty
  - Quality
  - Regularity
• Creativity continuum
• Are people creative or are actions creative?

Lateral and vertical thinking

• Lateral thinking
  - Digging a deeper hole
• Vertical thinking
  - Digging other holes

Genius and everyday creativity

• Example:
  - Alexander Calder
  - Creative genius but exposed to many things that influenced his work
• Rick Knowledge base is needed.
• Suzuki Violin Schools
Sensitivity

- Noticing relevant information
- Especially if not obvious
- For finding solutions and also for finding and defining new problems
- Creative people might “notice” more things

Synergy

- Bringing together two unrelated domains
- Example: The GUI
  - Visio–spatial ability and data entry
  - Mouse, Desktop, Trashcan, window, folder, Icon
- One way to foster creativity is to bring together diverse experts
  - The Beckman Institute

Serendipity

- Happy accidents
- But happy accidents only matter when someone notices them and realizes what has happened.
- The Lazy guy and the wheelbarrow

Investment in Creativity

- Buy low and sell high
- Creative people often work in unpopular or unknown domains and move on when the domain is popularized
- The difference between “Starsky and Hutch” and the “The Passion”
Creativity as a System

• Peer review is important
• Creative things must be good as well.
• There might might be many uncreative movies and music now, but there always was, we just don’t remember them

Stretching and Rejecting Paradigms

• Paradigm is an example used as a pattern, a way of thinking about problems.
• Wireless phones
  - Text messaging and cameras have changed the paradigm
• MTV
  - Promotional videos were internal industry things
  - MTV created a new paradigm

Problem definition

• Creativity sometimes means creating new problems
• Especially obvious in marketing
  - Instant messaging/text messaging
  - Chicago’s “cows on parade”
  - Viagra
  - Psychological drugs and selling the disease

Selecting relevant information

• Creativity often means solving a slightly different problem
• Counselor and therapists
  - Example: Marital problems
Generation, Exploration, Evaluation

- Creativity is good problems solving.
- A cycle
  - Generate new problems and solutions
  - Explore new possibilities
  - Evaluate efforts
- Creativity is time consuming and is hard work

Insight and Incubation

- Richer knowledge structures
- Creativity might depend of being knowledgeable
- The Lord of the Rings
  - Creative
  - Tolkien knew his mythology

Analogical Thinking

- Creative Analogies
  - Two concepts are seen as similar one very deep structures
- Archimedes and Eureka
  - Taking a bath is an analogy for volume

Making the familiar seem strange

- Sometimes too much familiarity is bad
- Experts can get in a rut
- Approaching a familiar problem from a strange angle can encourage creative thinking
  - Cubist art, abstract expressionism
  - Pop art and Andy Warhol
  - Punk Rock Music
Remote associations test
- River, Note, Blood
- Board, Duck, Dollar
- File, Head, Toe
- Boiled, Lid, Flower
- Ball, Malaria, Butter
- Class, Stage, Soccer

Encouraging Creativity
- Critical thinking and problems solving can be taught
- What about creativity?
- Creative people vs Creative activities
- The “creative” class
  - Artists and Musicians or Engineers and investment bankers

Creativity as a goal
- In Public schools?
  - Roman Numeral in Kindergarten
  - Handwriting in grade 1
  - Writing number from 1 to 100
  - Winnie the pooh CD-ROM
- Montessori schools, Waldorf Schools

Environmental Factors
- Intrinsic motivation
  - You do it because you love to do it
    - e.g. research
    - Fosters creativity
- Extrinsic Motivation
  - You do it because you have to
    - Your boss decides
    - Does not foster creativity
- How to kill intrinsic motivation
  - Constant evaluation
  - Surveillance
  - Reward
  - Competition
  - Restricted choice
    - Extrinsic orientation toward work
- School is not all bad
  - Creativity needs a rich knowledge structure
  - Sometimes that can only be gained through extrinsic work
  - Picasso was a skilled and trained realists first
**Personality**

- Non conformity
- Self confidence
  - The eccentric genius?
  - The eccentric regular guy?
  - The regular genius?
- G.W. Bush is creative in this sense

**Basic strategies for creativity**

- Rules for breaking the rules?
- No, just guidelines
- All these strategies encourage deeper thinking

**Productive thinking Program**

- In the 1970's for 5th and 6th graders
- Solving mysteries along with reading a book
- Many current PC and Video games are similar
- Might encourage some creativity, but no hard evidence

**Quantity**

- Brainstorming
- Have many ideas can encourage novel ideas
- Also encourages synergy
Creative Ideas Checklist

• “Forcing” people to think of different angles
  - Put to other use?
  - Adapt?
  - Modify?
  - Magnify?
  - Minify?
  - Substitute?
  - Rearrange?
  - Reverse?
  - Combine?
• Would this help you design a better class?

Attribute listing

• Every attribute of an item is listed and considered for combination
• Cooking a creative dinner in 30 minutes
  - Canned Tuna
  - One Piece of Left over chicken breast.
  - Deli Meat (ham, roast Beef)
  - Frozen peas and frozen corn
  - Milk, butter and eggs
  - Cheese
  - Some rice and pasta
  - Canned Tomatoes
  - Ramen Noodle soup
  - Garlic, onions, spices
  - Tortillas

Other possibilities

• Crovits’s Relational Algorithm
• Plus, Minus, Interesting
• Activating inert knowledge
• Browsing
• Visual Thinking