Creative Problem Solving

Overcoming the fear of failing
ICOM5047
J. Fernando Vega Riveros, Ph.D.

What ideas do you associate with creativity?

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- **Produce something**
- **Original idea**
- **Ingenuity**
- **Imagination**
- **Thinking out-of-the-box**
- **Craziness**
- **Extraordinary**
- **Innovation**
- **Eureka**

Have you been creative?

So, what is creativity anyway?

Myths about creativity

- **Accidental discovery (the "aha" or "eureka" experience)**
  - Few cases are found in creativity research
- **Genius view, great leaps of imagination**
  - Weisberg's view is that creativity is the result of ordinary thought processes by ordinary people
  - Plato's view: what appear as a new idea is a recognition of an old one or the new application of a concept; the connection may already exist in nature
  - Large number of patents from a large number of people
- **Moment of Inspiration, the Muse experience**
  - Hard work in arts
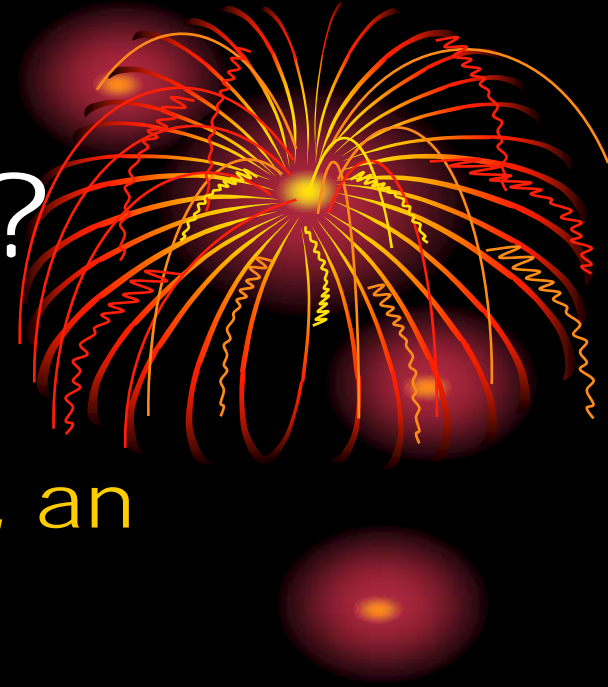
What is creativity?

To be creative, a solution must satisfy one or more of the following conditions:

1. The product of the thinking has novelty or value (either for the thinker of for his culture)

2. The thinking is unconventional in the sense that it requires modification of rejection of previously accepted ideas

3. The thinking requires high motivation and persistence, taking place either over a considerable span of time (continuously or intermittently) or at high intensity

4. The problem as initially posed was vague and ill-defined, so that part of the task was to formulate the problem itself.

Newell, Simon and Shaw

What is creativity?

To be classified as creative, an improvement must:

1.Be new or unique

2.Have utility or value

Metatheory of creativity

- **Core of creativity:**
  - conscious;

  - **Unconscious and**

  - **Cognitive attributes**

Metatheory of creativity

- **Sum total of subjective experiences associated with creating: buffer zone between stimulation from within and from without**

- **Outside is perceived, organized and integrated within the individual**
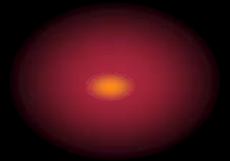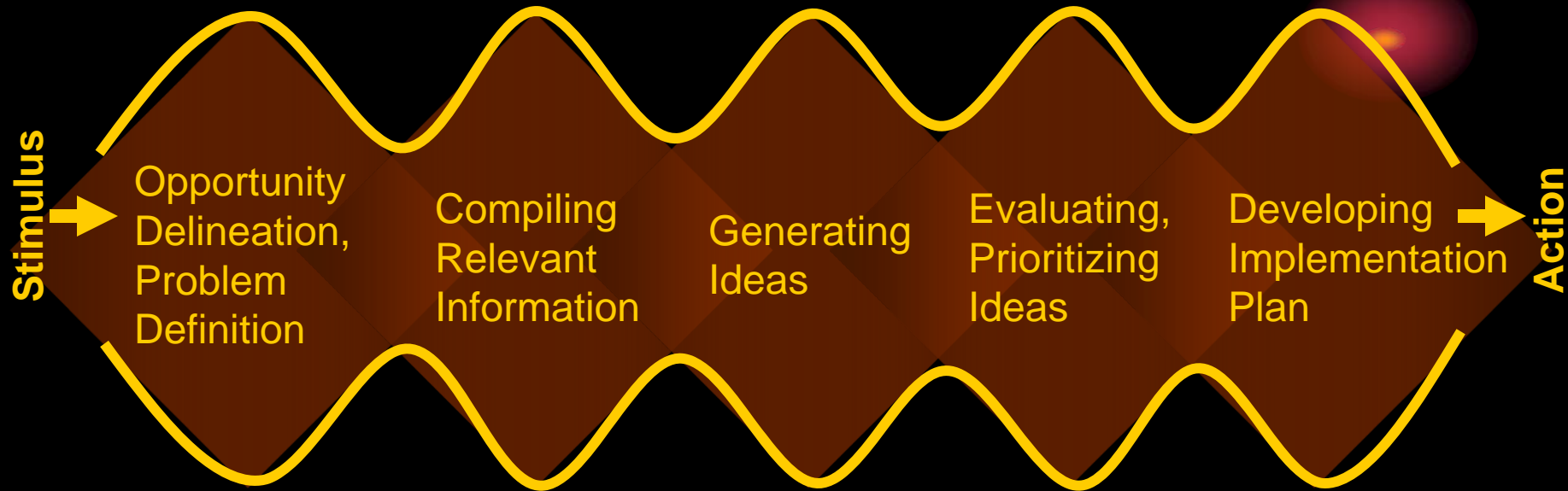
Metatheory of creativity

Phases

Preparation

Incubation

Discovery

Elaboration

Validation

Creative Problem solving

Stimulus → Opportunity Delineation, Problem Definition → Compiling Relevant Information → Generating Ideas → Evaluating, Prioritizing Ideas → Developing Implementation Plan → Action

Brain writing exercise

- **Individually write down three problems that of interest to you and order them according to the relevance to you (3 minutes)**

- **Form teams of four and choose by consensus one problem per team (5 minutes)**

Unstructured vs. Structured creativity

- **Spontaneity**
- **Inspiration**
- **Accident**
- **Serendipity**
- **Creative trance**
- **Dream**

- **Write ideas and file them away**
- **Training**
- **Preparation**
- **Practice**
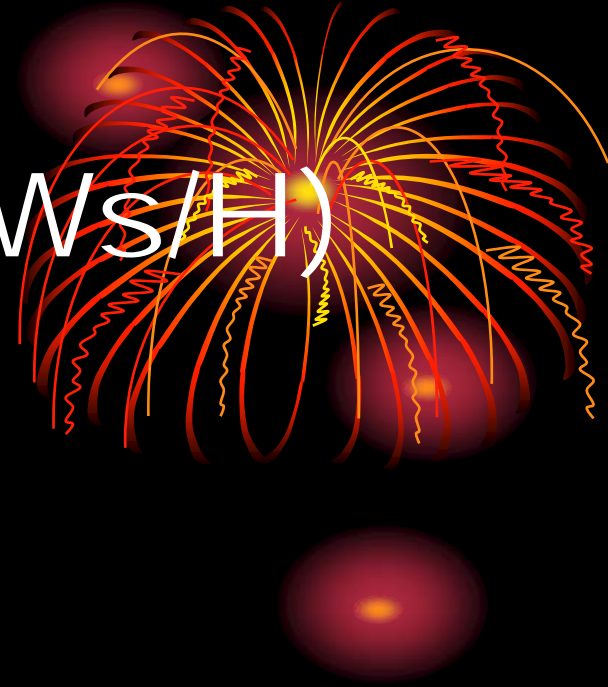- **Technique**

Creativity Techniques

- **Progressive abstraction**

Shortage of Human Capacity at Professional Level

Shortage of Professional Employees

Shortage of Entry Level Professional Employees

Interrogatories (5Ws/H)

- **Why**
- **How**
- **When**
- **Where**
- **Who**
- **What**

Force Field Analysis

- **Write a brief statement of the problem to be solved**
- **Describe what the situation would be like if everything fell apart – absolute catastrophe**
- **Describe what the situation would be like if everything were ideal**
- **With catastrophic at the left and ideal at the right, draw a center line**
- **On the continuum, list the forces that are contributing to make the situation more ideal and those contributing to make it more catastrophic**
  - **Strengthen an already positive force**
  - **Weaken an already negative force**
  - **Add a new positive force**

Associations/Images Technique

1. Leader assists group in identifying the problem or opportunity to be expanded
2. Leader asks participants to select a solution to the problem, phrased in the form of a goal or wish
3. Leader picks a key concept to the goal/wish statements
4. Leader asks the group to think of a world that is remote from the world of the problem (leader chooses the remote world)
5. Leader request to set aside the problem and goal/wish developed and to lists associations and images that characterize the remote world
6. Leader directs the group to relate the list of associations and images of the remote world to the world of the problem
7. Leader directs group to develop second-generation associations and images from any one of those listed in step 6, extracting key principles and applying them in a more realistic way without diluting the innovation
8. Group selects and implements appealing ideas developed in step 7

Wishful thinking

1. Develop a problem statement
2. Open solution space to all possibilities, i.e. anything is possible
3. State alternative in terms of a wish or fantasy
4. Convert each wishful statement to a more practical one
5. Move on to the normal analytical problem solving approach to develop a solution

Analogy/Metaphor technique

1. Withholding evaluation, generate a list of objects, persons, situations or actions that are similar but unrelated to problem
2. Select one of the analogies and describe it in detail (avoid any reference to original problem)
3. Examine items and translate them into statements that apply to the problem
4. Examine each statement and discuss its application to the problem

Releasing creativity

- **Creativity and innovation involve risk**
- **Taking risks may lead to failure**
- **Society and Education has penalized failure**
- **Failure is opportunity to learn**

Creative problem solving

- **For the problem chosen by your team, use one of the creativity techniques to come up with an innovative solution (10 minutes)**

- **Remember to let divergent ideas flow at first. Write down every idea.**

- **When told (when 2 minutes are left), synthesize your team solution and write it down on the large paper sheet to present it.**

- **Choose one member to make an effective presentation of your problem and solution.**

Partial truths

- Risk taking involves uncertainty but...
- Success can only come from new ideas which can be implemented
- Failure and success are tightly bound in the exploration of new ideas
- Partial truths extracted from each failure, if recognized and incorporated into subsequent actions, help us attain our goals

Three rules of innovation

- **STRAFE: Success Through Rapid Accelerated Failure and Entrepreneuring**
- **GIN: Generate Ideas in Numbers**
- **Fast History: Any successful design is transient and so are ideas, thus, diversify ideas and concepts**
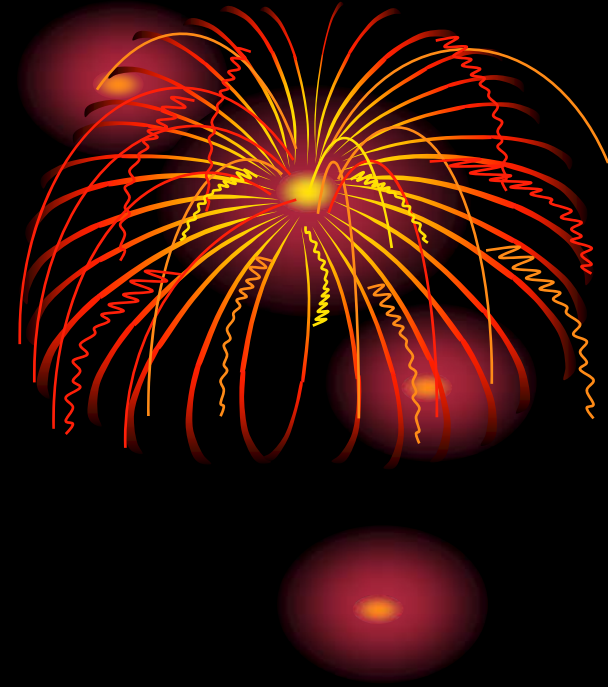
On good ideas
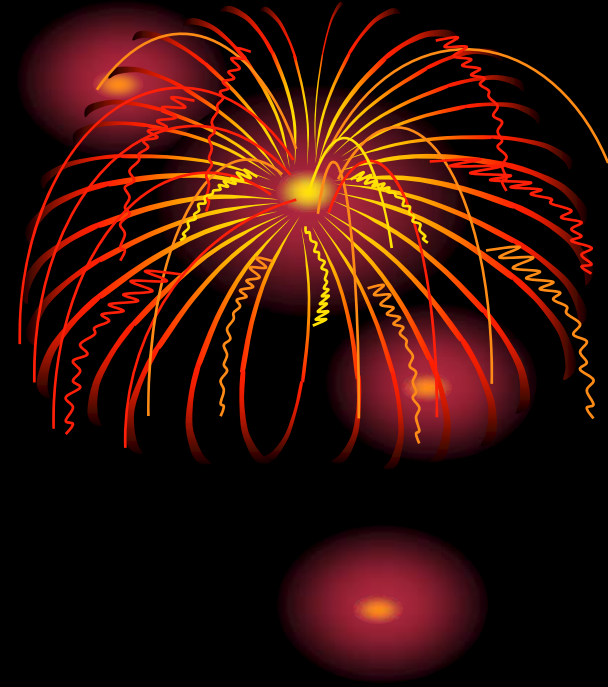
"The best way to get a good idea is to get a lot of good ideas"

Linus Pauling

Where can I find innovation

"Innovation is everywhere; the difficulty is learning from it"

John Seeley Brown