

# **BASIC ENGINEERING DESIGN**

## **Creativity**

**GEN- N1003**

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**Lecture 5**

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# Creativity



# Why Creative Thinking?

- *The engineering college graduate* should be able to deal with complicated technical problems, depending on his *experience*.
- His *basic education* in mathematics, physics, and chemistry, is at its best *just enough* to allow him *to improve or change* his technological basis and at its minimum "instrumental" in a sense similar to that afforded to a high school technician.

# The Concept of Creativity

“The skill of bringing about **something new and valuable**”

Young, John G. (1985) “What Is Creativity” *The Journal of Creative Behavior*

“The capacity to **solve problems** in new ways and to produce works that are **novel, suitable, and socially valued**”

Kerr, Barbara. & Camea Gagliardi. “Measuring Creativity in Research and Practice”

It is the ability of the human mind to form **new relations** in order to change the world

# The Concept of Creativity

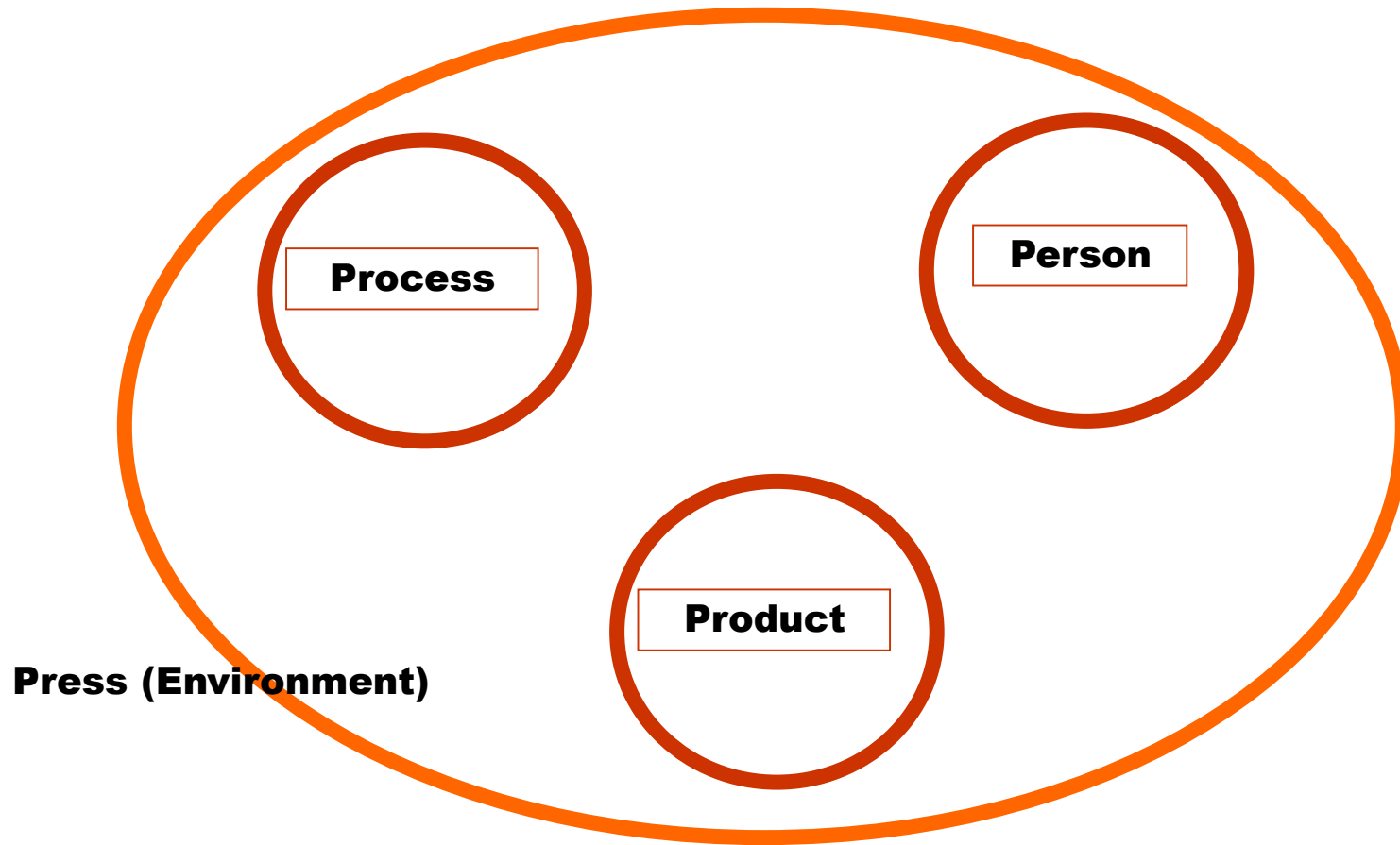
## CONCEPTUAL SPACE

- Its dimensions **give structure** to a given domain of thinking.
  - It is the generative system that defines a certain **range of possibilities**.
- 
- A **small change** in this space is like opening the door to an unvisited room.
  - A large change or transformation is like the construction of a new house.

**Exploration often leads to new ideas**



## Components of Creativity



Rhodes, M., (1961) *An Analysis of Creativity*

## Components of Creativity

Since creativity is intangible, “Rhodes” proposed a classification system that allows us to look at creativity; the system divides creativity **into four basic tangible** elements: creative **Person**; creative **Process**; creative **Product**; and creative **Press** (environment), these are called the **4P's of creativity**.

**The creative person** reflects particular **abilities**, skills and potentials, possesses some **attitudes** as: curiosity, imagination, complexity, risk taking, as well as some **behaviors** like: flexible, imaginative, .....

**The creative process** simply is the way people **create** and **use their creativity**, or the steps followed to create the product, The creative process is **complex, spontaneous, never-ending**, depends on **divergent & convergent** thinking, its results are **unknown** previously, and it is a **multi-solution process**.

**The creative product** is the artifact of creativity, the final **output**, the result or realization of an innovative idea or concept, “Moss” defined the creative product as **one that possesses some degree of unusualness (originality) and usefulness**

**The creative press** is the environment or context **surrounding the creative person**, process or product, it should **encourage** creative behavior, it provides **freedom** to creative person, motivates the creative process, and appreciates the creative product.



# Useless Object Game (5 minutes)

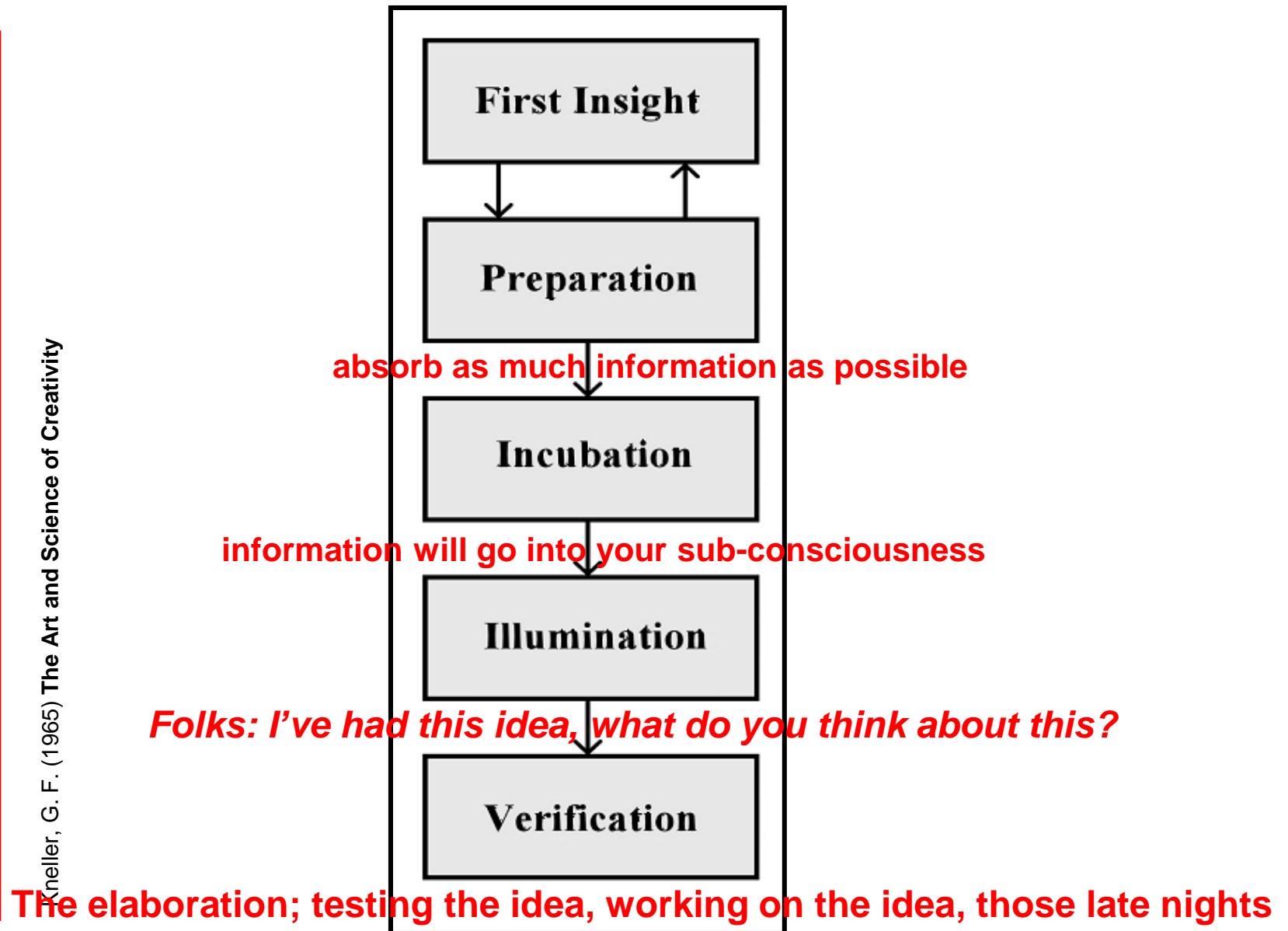
1. Think of Four objects around you.
2. Write them down on a piece of paper.
3. For each object, think of as many different uses as you can.
4. Do not be afraid to put down uses that seem too big or silly.

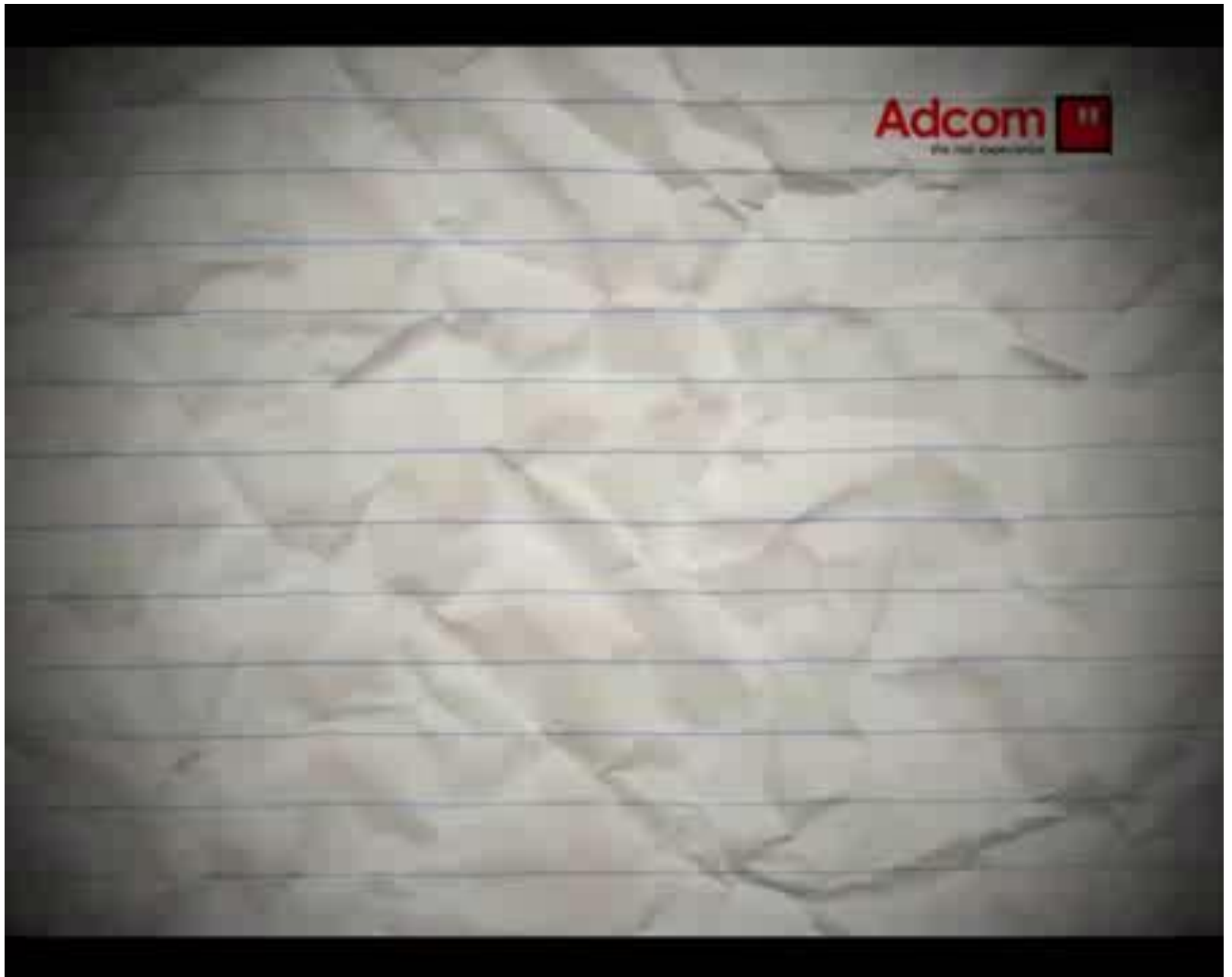
# To tell

- Student on my left side, first row, last one from the wall. <First Object>
- Student on my left side, third last row, third one from the wall. <Second Object>
- Student on my right side, first row, fourth one from the wall. <Third Object>
- Student on my right side, second last row, first one from the wall. <Fourth Object>

# Creative Process

Kneller, G. F. (1965) The Art and Science of Creativity





## **Level & Style of Creativity**

**All people are creative or have the creative abilities but with different levels and styles.**

### **Level of Creativity**

**Creativity could be measured through these four skills**

**Fluency**

**Flexibility**

**Originality**

**Elaboration**

### **Style of Creativity**

**Adaptive**

**Innovative**

## Creative Thinking Skills

### Fluency

The ability to think of and to create **MANY** ideas. This criteria is **quantitative**.

### Flexibility

The ability to think of **VARIED** ideas, or to look at things from **different perspectives**.

### Originality

The ability to think of **UNCOMMON** ideas. This criteria is **qualitative**.

### Elaboration

The ability to **expand ,develop or modify** an idea or to add details to it.