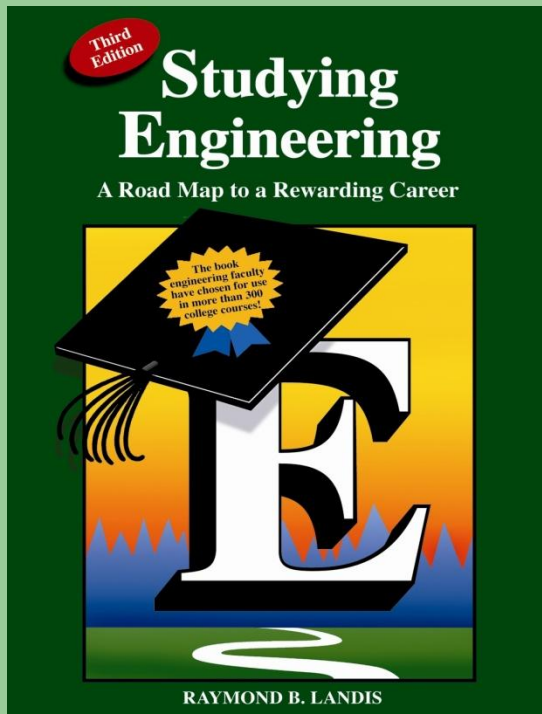


# Chapter 3

## *Understanding the Teaching/Learning Process*

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# Chapter Overview

- Intellectual Skills
- Creative Thinking Skills
- Metacognition

# Cognitive Learning

**Cognitive learning** is acquiring

- New knowledge
- Higher level intellectual skills



# Intellectual Skills



# Analyzing



Analyzing  
Categorizing  
Comparing  
Contrasting  
Questioning  
Predicting

Breaking into parts:  
How parts relate to each other and overall structure?



# Evaluating



Making judgments  
Based on standards  
Via checking & critiquing

Assessing  
Judging  
Evaluating  
Supporting  
Critiquing  
Rating



# Creating



Assembling  
Planning  
Composing  
Constructing  
Creating  
Organizing

Putting elements together  
To form a functional whole



# Intellectual Skills

Can we think at the higher levels if we

- have no basic knowledge
- lost in concepts
- fear new problems?



Recall six levels of intellectual skills by Bloom's taxonomy

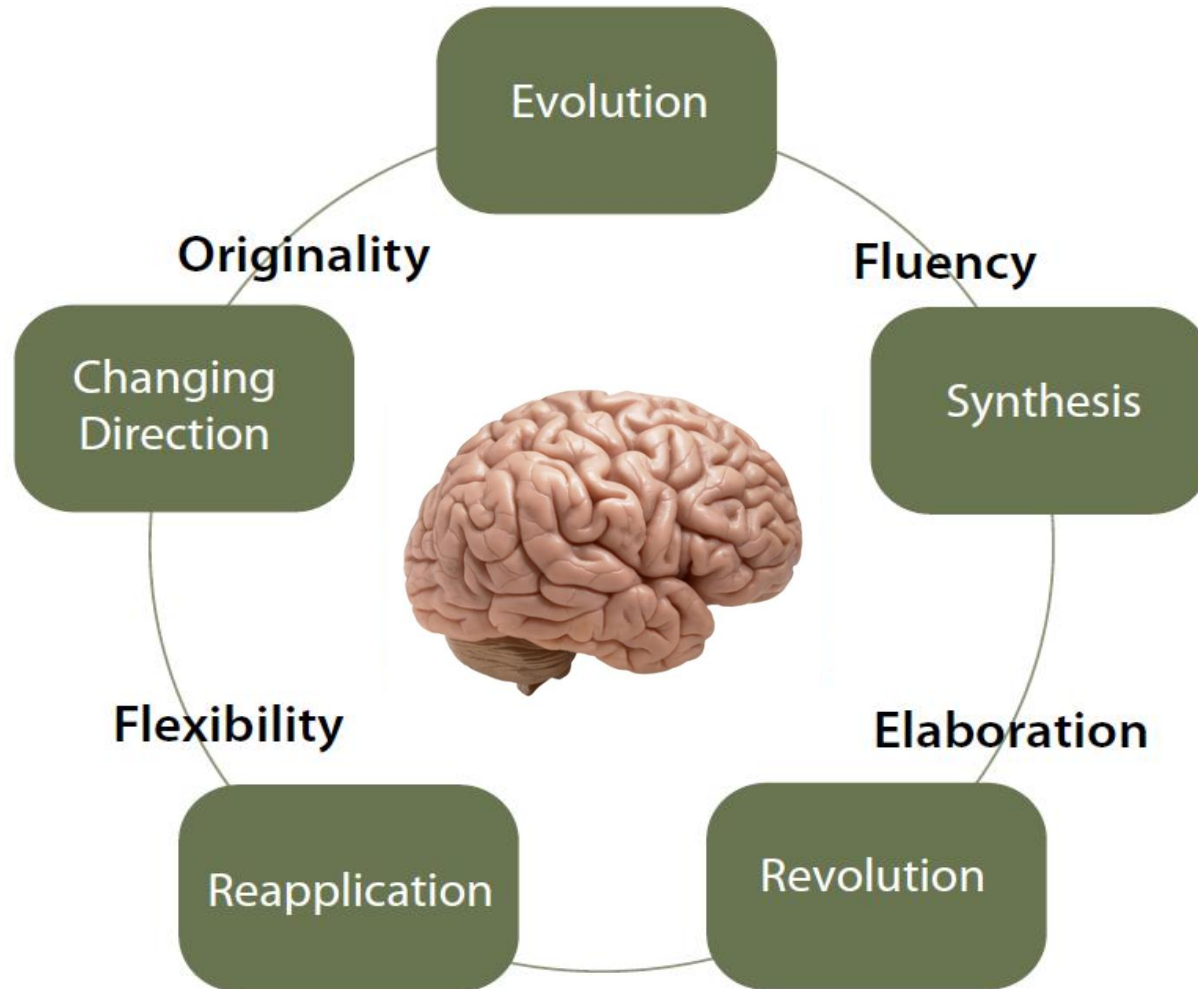


# Creative Thinking

**Creativity** is the process of producing something that is original and worthwhile

**Creativity** is playing with imagination and possibilities while interacting with ideas, people, and the environment, thus leading to new and meaningful connections and outcomes

## Creative Thinking Techniques



# Creative Thinking

## Evolution: incremental improvements



USA 1978



USA 2009



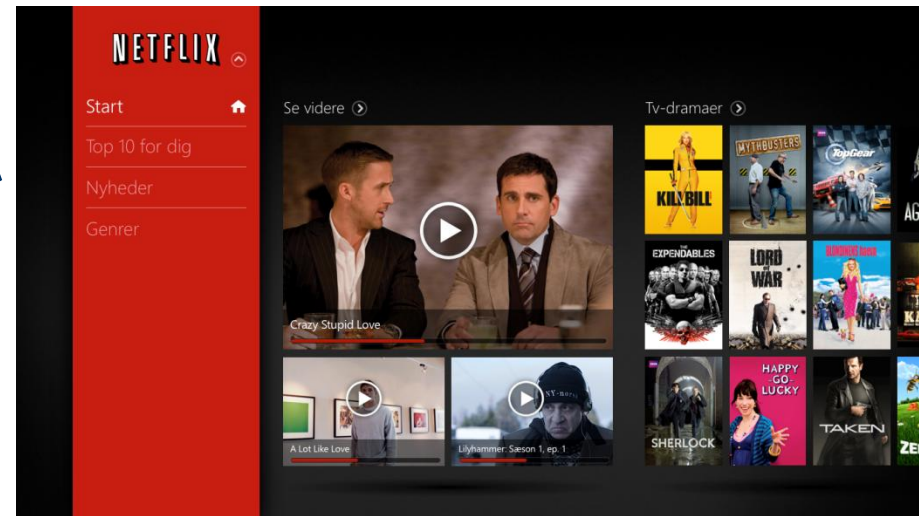
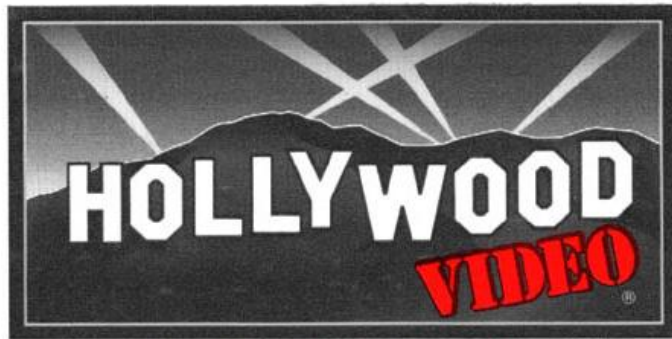
Germany 1978



Germany 2009

# Creative Thinking

**Synthesis:** combine old ideas into new



## Revolution



**Screwworm flies led to  
\$25,000,000 of damage**



**Knipling and Bushland had a revolutionized idea to  
sterilize the males**

# Creative Thinking

**Reapplication:** look at old things in a new way



William "Pa" Klann introduced the idea of an **assembly line** to *Ford Motor Company* upon his return from visiting a slaughterhouse, where animals were butchered as they moved along a conveyor

# Creative Thinking

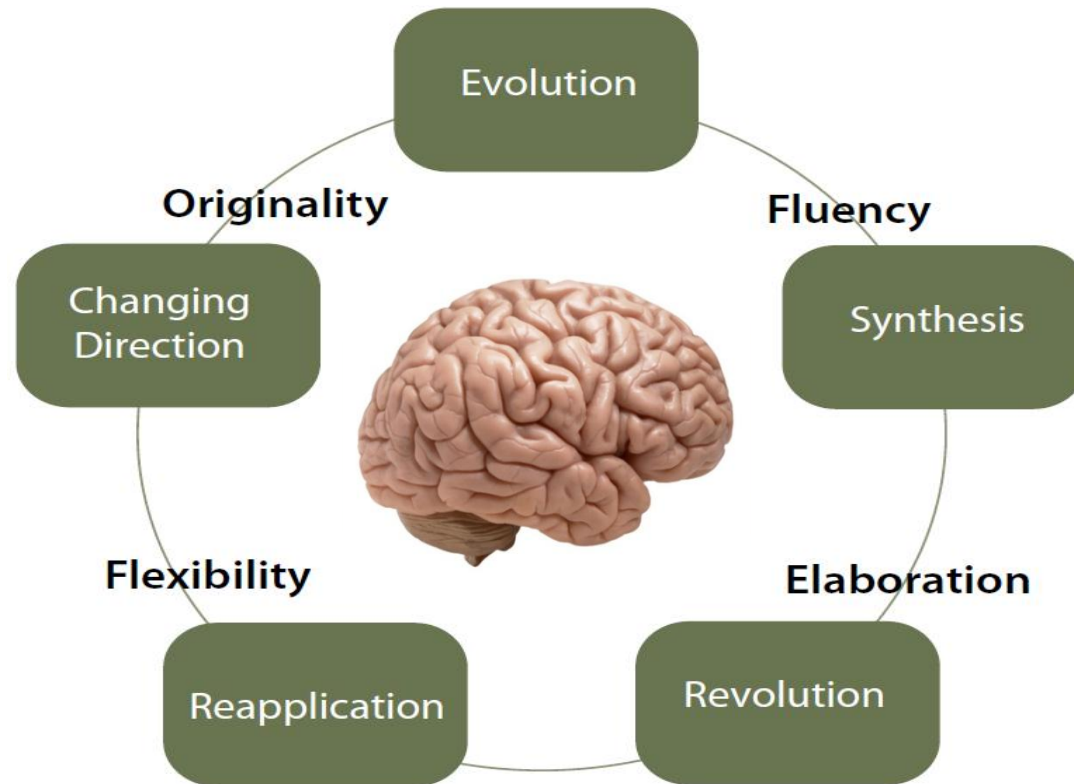
**Changing Direction:** shift from one angle of a problem to another

How to prevent customers from stealing expensive cutlery?

Solution: use chip disposable paper and plastic cutlery



# Creative Thinking



Choose any two of these techniques and provide an example  
Of creative thinking with application of these technique



# Metacognition

## Metacognition

is the process of improving your learning by

**Observing**

**Making  
changes**

**Feeding  
back**



# Metacognition

## Planning

Why am I doing this?  
How much time?  
What to do first?  
What prior knowledge will help me with this?

## Monitoring

How am I doing?  
What info is important?  
How is my pace?  
What to do to improve understanding?

## Evaluating

How well did I do?  
Which strategies were most effective?  
What could I have done differently?  
Do I need to go back and fill in any “blanks”?