

Creative and Scientific Thinking

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CRE252

Information Technology Department

Lecture 10



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Learning Objectives:

- **Edward De Bono**
- **The Six Thinking Hats**
- **Adventures of using this technique**

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Edward De Bono



Edward De Bono

- ❑ Edward De Bono is a world-known expert in creative thinking.
- ❑ The 6 Thinking Hats is one of the techniques that he invented.
- ❑ Requires students (and teachers),to extend their way of thinking about a topic by wearing a range of different 'thinking' hats.

Edward De Bono

- ❑ He believed that people need to embrace the concept of thinking ONE
THING at a time
- ❑ This allows thinkers to separate emotion and other baggage from logic.

Edward De Bono

The main idea:

- ❑ Is to have the group “wear one hat at a time” when considering a problem.
- ❑ The wearing of the hat is metaphorical i.e. everyone will look at the problem at hand from only one perspective, the perspective indicated by the hat colour.

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The Six Thinking Hats



The Six Thinking Hats Metaphor

- ❑ De Bono uses the thinking "hat" metaphor because of familiar expressions such as "put on your thinking cap (hat)".
- ❑ The hat is a tangible object that one can literally wear or that one can visualize putting on or taking off.

The Six Thinking Hats Metaphor

- ❑ "Putting on" a hat is a deliberate process that switches the thinker's attention exclusively to that mode, thus simplifying the thinking process;"switching" hats redirects thinking to another mode.

The Six Thinking Hats Metaphor

- ❑ The artificiality of the hats is their greatest value; they provide a formal and convenient way to request a certain type of thinking from oneself or others (de Bono, 1985).

Six Thinking Hats:

- The colors of the hats are: white, red, black, yellow, green and blue.
- These colors were chosen for a reason. They're associated with certain situations which will help you remember the objective of each separate hat.

Six Thinking Hats:



Guide lines

- Use hats to focus the thinking ... one at a time
- Don't have to use all the hats
- Can use some hats more than once
- No debates or arguments ... brainstorm

Guide lines

- Begin with blue
- End with blue
- Keep red brief
- Keep time (3-4 minutes per hat)

Six Thinking Hats:



Blue Hat:

- Managing of the thinking itself. making decisions and drawing conclusions.



Six Thinking Hats:



Blue Hat:

- A cool blue sky allows you to overview over the thinking processes.
- The blue hat holders guides and controls the session.

Six Thinking Hats:



White Hat:

- Focus your thoughts on information, facts and figures.
- Imagine white paper and computer print-outs. Most of the time paper is white.

Six Thinking Hats:



White Hat:

- The white hat, just like most paper, refers to **information** and facts.

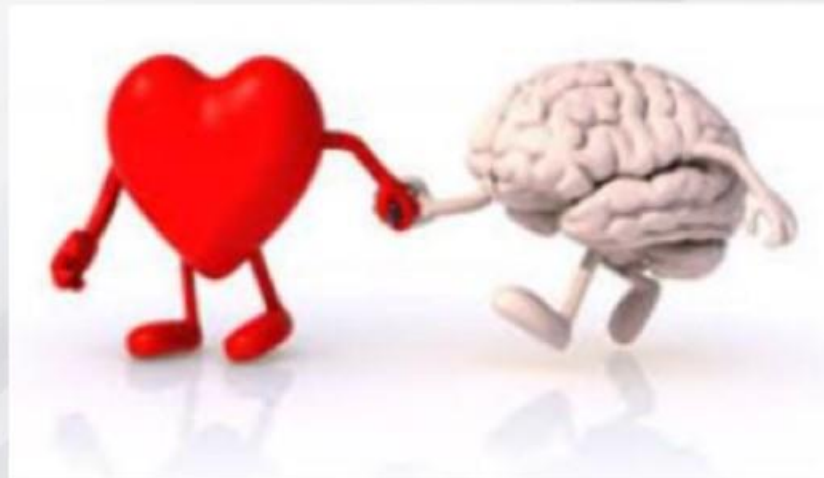


Six Thinking Hats:



Red Hat:

- Unlimited use of feelings, intuition and **emotions** which don't have to be justified.



Six Thinking Hats:



Red Hat:

- Imagine the red glow of a soaring fire.
- Take no more than 20 to 30 seconds

Six Thinking Hats:



Black Hat:

- Warning! Difficulties, dangers and problems.



Six Thinking Hats:



Black Hat:

- What can go wrong?
- What could be the possible problems?
- What are points for caution?

Six Thinking Hats:



Yellow Hat:

- Remember a bright and sunny day, how easy it gets to feel optimistic about life.



Six Thinking Hats:



Yellow Hat:

- Focus the thinking on benefits, values and attainability.
- What are the positives? What are the benefits?, What are the values? What Are there savings?

Six Thinking Hats:



Green Hat:

- Leaves and trees all are vibrant with the creative energy of life.
- Your green hat represents your **conscious creative** efforts.



Six Thinking Hats:



Green Hat:

- It includes generating ideas and looking for alternatives.
- No logic required this time.
- Just let your imagination run wild.

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Advantages of using Six Thinking Hats technique



Advantages of using Six Thinking Hats technique:

- Guides thought processes in one direction at a time so we can effectively analyze issues, generate new ideas, and make decisions.
- It helps put our opinions aside so we can focus on a way forward, without argument.

Advantages of using Six Thinking Hats technique:

- Help members to see from a number of different points of view.
- It allows necessary emotion and skepticism to be brought into what would otherwise be purely rational decisions.

Advantages of using Six Thinking Hats technique:

- It opens up the opportunity for creativity within decision makings. It also helps, persistently pessimistic people to be positive and creative.

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Preparing Six Thinking Hats Session



Preparing Six Thinking Hats Session:

First of all you need an **idea**, a problem to solve, a product to create, a service to promote, etc.....

What are we working towards?

What results do we expect of this thinking session?

How do I use these Six Thinking Hats then?

- A particular hat is used in itself to emphasize a certain way of thinking or switch to a different style.
- Before and after using the hat the conversation is a traditional argument or discussion.

How do I use these Six Thinking Hats then?

- Determine a sequence for using the hats: your thinking agenda.
- Then use the different hats in turn.

Modify the approach - Switch Hats to Switch Your Thinking:

- The great virtue of the six thinking hat technique is that it **allows** you and the others to change thinking hat without offense BUT it is advisable to announce it first so that the members know what type of thinking is being use.

Modify the approach - Switch Hats to Switch Your Thinking:

- If a person is being negative, you say, “That is good black hat thinking; let us have some more of it”. Then after a while you say, “We have had a lot of black hat thinking-now let’s try some green hat thinking”. The black hat wearer must now keep quiet or make a green hat effort.

Modify the approach - Switch Hats to Switch Your Thinking:

- It is perfectly true that some people are much better at one type of thinking than another. But, that is exactly the opposite of the purpose of the six hats. Everyone must make an "effort" to use the hats. When a group is doing green hat thinking then everyone is "wearing" the green hat at that time.

Advantages of using Six Thinking Hats technique:

- Guides thought processes in one direction at a time so we can effectively analyze issues, generate new ideas, and make decisions.
- It helps put our opinions aside so we can focus on a way forward, without argument.
- Help members to see from a number of different points of view.
- It allows necessary emotion and skepticism to be brought into what would otherwise be purely rational decisions.
- It opens up the opportunity for creativity within decision makings.
- It also helps, persistently pessimistic people to be positive and creative.

Summary:

- **White hat:** who are the parties/companies involved in this issue?
What information do we have?
- **Red hat:** What's the feeling of others parties/citizens?
- **Black hat:** What are the negative effects of the haze?
- **Yellow hat:** What is the positive impact of this issue?
- **Green hat:** What can be done to address the haze issue?

Latest Developments in Creative and Scientific Thinking



1. Introduction:

Focuses on the latest developments in creative and scientific thinking, and how modern tools—especially **artificial intelligence, data-driven methods, and cross-disciplinary collaboration**—are transforming the way we generate and evaluate ideas.

Creative and scientific thinking **are no longer separate skills; they complement and strengthen each other in innovative problem-solving.**

2. The Evolution of Creative Thinking in the Modern Era:

AI-Supported Creativity

- Tools like generative AI (ChatGPT, Midjourney, Gemini) can **now produce text, images, designs, and prototypes within seconds.**
- They help spark ideas, break creative blocks, and explore alternative perspectives.
- AI is used in advertising, product design, UX/UI, education, and entertainment.

3. Modern Developments in Scientific Thinking:

A. Data-Driven Scientific Method

- **Scientists now use** big data, machine learning, and simulation modeling to test hypotheses faster than traditional experimentation.
- Example: AI models predicting protein structures, drug discovery, climate simulations.

B. Interdisciplinary Research

- Complex problems (like sustainability, healthcare, smart cities) require combined expertise:
 - o biology + computer science
 - o engineering + psychology
 - o art + technology
- This fusion strengthens scientific reasoning and leads to innovative solutions.

**Modern Applications Where Both
Creative and Scientific Thinking Merge**



1. AI-Driven Problem Solving

- AI systems can assist in brainstorming solutions for education, medicine, transportation, and environmental issues.
- Example: AI-powered early cancer detection blends scientific reasoning with creative algorithm development.

2. Innovation in Education

- Virtual Reality (VR) and Augmented Reality (AR) allow students to experience simulations that foster creative exploration and scientific analysis.
- Example: virtual science labs, immersive storytelling, real-time experiments.

3. Sustainable Innovation

- Designers use creativity to rethink materials (biodegradable plastics, plant-based leather).
- Scientists validate these ideas through testing and data analysis.
- Creativity + scientific method = environmentally responsible solutions.

4. Creative Robotics and Automation

- Robots that paint, compose music, or collaborate with humans in industry.
- Encourages new discussions about human imagination vs AI capabilities.
- Integrates engineering, art, and scientific logic.

Skills Required for the Future



- **Critical Thinking:** Analyze evidence before drawing conclusions.
- **Open-Mindedness:** Accept alternative explanations.
- **Creative Flexibility:** Changing strategies quickly.
- **Data Literacy:** Understanding how to use technology and data responsibly.
- **Collaboration:** Working across disciplines and cultures.

Conclusion:

The world is moving toward an era where **creative and scientific thinking work hand-in-hand**.

- AI, data science, design thinking, robotics, and sustainability **are leading this transformation**.
- Students who combine creativity with scientific reasoning will be **best prepared to innovate, solve real-world problems, and shape the future**.

Thank You