

A Review of the Use of Six Thinking Hats in Creativity and Problem Solving

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Abstract—This paper looks at the use of Six Thinking Hats in the Problem-Solving domain. It first introduces Six Thinking Hats; how it works and how to use it. Following that two papers are reviewed that use this technique. The first paper, Charles Kivunja (2015), looks at the use of this technique in the context of achieving success in the 21st century economy. The second paper, Sreeramana Aithal (2017), looks at another use of this technique in the context of six different approaches to analyze a given problem and how can one reach an ideal solution. Following these papers an experiment undertaken by the author is detailed, explaining the context in which it was used, how it was used, what results were achieved, and some reflections on the process.

Index Terms— Problem Solving, Creativity, Six Thinking Hats, Innovation.

I. INTRODUCTION

THIS paper looks at the ‘Six Thinking Hats’ creativity technique, which was developed by Edward De Bono in 1986. The main principle for this technique is human brain is designed in such a way that it can think in various aspects but for contemplating specific issues an individual need to be organized in a manner to create strategies. De Bono discovered six particular hats in which the human brain can be tested where each hat brings in cognizant ideas and divergent thinking to every problem through a different color. These hats are just metaphors for thinking styles.

Blue: Control and Planning Hat

This hat manages thinking and process control and is mostly put on by the facilitator to keep the agendas and summarize the meetings.

White: Information Hat

This hat focuses on the facts and data. It ensures knowing the objective.

Black: Safety Hat

It identifies risks, problems and challenges, and it’s also known as devil’s voice.

Yellow: Optimistic Hat

It identifies benefits and values. It considers both short- and long-term perspective towards a goal.

Green: Creative Hat

It helps explore new ideas and other alternatives to a solution. It can also be used to remove faults and risk which we explored with black hat.

Red: Feeling / Intuition Hat

This hat expresses intuitions and gut instincts and shouldn’t be wore for a longer duration.

This technique is particularly useful for parallel thinking (in a same direction) specially for a group in a more comprehensive and continuous way. Or in other words, it’s just a way to critique objectives or proposals by just being straightforward, pragmatic and honest to enhance the quality of decision making.

II. OTHER RESEARCHERS USE OF SIX THINKING HATS

In this section we’ll review two papers who have used six thinking hats in their work and look at how they have used it and the outcomes of its use. The two papers we are going to look at are, “Using De Bono’s Six Thinking Hats Model to Teach Critical Thinking and Problem Solving Skills Essential for Success in the 21st Century Economy” by Charles Kivunja in 2015, and “Ideal Analysis for Decision Making in Critical Situations through Six Thinking Hats Method” by Sreeramana Aithal in 2017.

A. *First Paper*

The first paper, Charles Kivunja (2015), looks at the use of this technique in the context of achieving success in the 21st century economy. Critical Thinking and Problem Solving are the requisites to accomplish anything but throughout the world these skills are not even a part of any educational programs. This paper explains how these skills can be directed to the students using the De Bono’s Six Thinking Hats model. De Bono claims whenever we try rational thinking, we encounter three major obstacles:

- a) Emotions
- b) Helplessness
- c) Confusion

The Six Thinking Hats approach provides an elemental scheme

for actions where we can think unidirectionally besides sentiments for specific problems. There are six strategies which were listed down in the research paper, which were:

a) Black Hat Strategy

In this strategy there were questions which were designed such that the students were directed to think critically like:

- Is this solution to this problem feasible?
- If in this way, we proceed what can go wrong?
- What are the weaknesses to this solution?
- What is the proposed model framework?
- What are the consequences if this plan didn't work out?
- What are the evidences?
- What can be the reasons of the proposed plan not working out?

b) Blue Hat Strategy

- What is the purpose and what are we trying to achieve?
- How are we trying to achieve the desired outcome?
- How can we examine the steps and the implications?
- What is the progress?

c) Green Hat Strategy

- What are the new ideas behind the problem?
- What is the strategy to generate brainstorming ideas?

d) Red Hat Strategy

- How do we exactly feel about the problem?
- What are the preferred actions?
- How can we assess the problem?
- What are the exciting and boring part of the study?

e) White Hat Strategy

- What are the facts and information known about the problem?
- What is missing in this information?
- How to validate this information?
- What information can further help to ease our efforts?

f) Yellow Hat Strategy

- What are the benefits or advantages?
- How will the idea efficiently manage the problem?
- What can be the alternatives?
- Will the time frame be sufficient to carry on the task?

Their outcomes were that, critical thinking and problem solving are very essential way to efficiently manage the life, although these things won't be given much importance in the curriculum of education system which may lead to pedagogical

void. These hats are equally important, and every hat has its own advantages to understand and identify the problem statement. If these techniques are added to the curriculum then people may explore a critical and constructive approach to thinking.






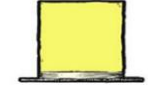
Metaphorical Coloured Hat	Conceptual Meaning of Each Coloured Hat
	Black Hat Thinking <ul style="list-style-type: none"> • Cautious critical thinking • Questioning, checking and checking out the feasibility of alternative approaches to problem solving • Assessing situation being confronted • Trying to identify what's wrong so as to fix it • Examining the weaknesses in suggested approaches • Evaluating and passing judgement about bad points
	Blue Hat Thinking <ul style="list-style-type: none"> • Organisational critical thinking • Metacognition • Questioning organisational thinking to problem solving • Assessing past performance • Analysis of our situation: <ul style="list-style-type: none"> ○ Where have we been? Where are we now? ○ Where do we want to be? How do we get there?
	Green Hat Thinking <ul style="list-style-type: none"> • Creative critical thinking and problem solving • Coming up with the ideas to advance understanding • Critical analysis of alternative ways to solve current problem • Envisioning new ways to solve problems • Coming up with hitherto non-considered proposals • How about trying this new approach to problem solving?
	Red Hat Thinking <ul style="list-style-type: none"> • Critical thinking expressing personal emotions • Being intuitive as we approach a problem to solve • Drawing upon personal feelings and hunches • Allowing feelings to be expressed without need for justification • It is okay to feel different
	White Hat Thinking <ul style="list-style-type: none"> • Calling for information that facilitates problem solution • Gathering data to understand the issue or problem to solve • Asking questions about available evidence • Raising questions about additional data needed to get to the truth. • What information do we already have? What does it tell us about the problem? • What more information do we need to solve this problem?
	Yellow Hat Thinking <ul style="list-style-type: none"> • An optimistic approach to problem solving • Here are the good points in our favour as we approach this problem. • These are our strengths that we can use to solve this problem. • We can do this because of these reasons. • This alternative approach will enable us to solve the problem because of these attributes. • This option will work because of this.

Fig. 1. An overall blend of De Bono's STH Model

B. *Second Paper*

The second paper, Sreeramana Aithal (2017) looks at another use of this technique in the context of six different approaches to analyze a given problem and how one can reach an ideal solution.

The six hats mentioned here correlate to six different thinking styles used in a systematic problem-solving procedure. On the other hand, each hat is conceptualized with a different color, through which every individual focuses on a principal style of thinking analogous with each color so that a given problem can be evaluated from different angles or frames of reference to achieve the ideal solution. Different judgments are passed through each hat, few being neutral quantitative judgment, humanistic thinking, optimistic, creative, negative, or managerial thinking. The best solution would then be determined by choosing the best possibility from each approach. This would be defined as the first stage. Every manager in any organization faces issues that need quick and efficient results. The capability of decision-making is dependent on the thinking capability and the personality of an individual. One solution to this problem is the Six thinking hats introduced by Edward de Bono. In this paper, the authors have defined how one can adopt the methodology of Six Thinking Hats to achieve an ideal solution. One such advantage this method plays is to achieve efficient and product meetings to discuss problems. The authors have also explained this with a

case of hiring a candidate for a mid-size position in a strategic role where two options could yield two sets of decisions – conventional way and alternative way.

In addition to this, the technique plays a vital role in forming critical solutions where time and money are important factors. In such situations, the information at hand is limited and the risk of a wrong decision is high. Six major thinking styles can be defined in the approach to arriving at a solution to a problem or critical situation where it becomes very important to understand the problem through all angles and then reaching an ideal solution from the best solutions. The paper has also defined criteria of an optimal solution a few being time-independent, independent of internal and external factors to the system, will not consume resources like material, energy, and time. We can understand how one can develop the optimum solution, what their properties are and what their basis of thinking is through each hat.

To conclude, the first stage is the application of six thinking hats in ideal analysis generating a large number of feasible solutions through each thinking hat approach. Furthermore, for the second stage we can choose the optimum solution from every set and finally the ideal solution from these optimum solutions. The main idea is to focus on finding the best possible decision as an ideal decision that has maximum gain and minimum loss.

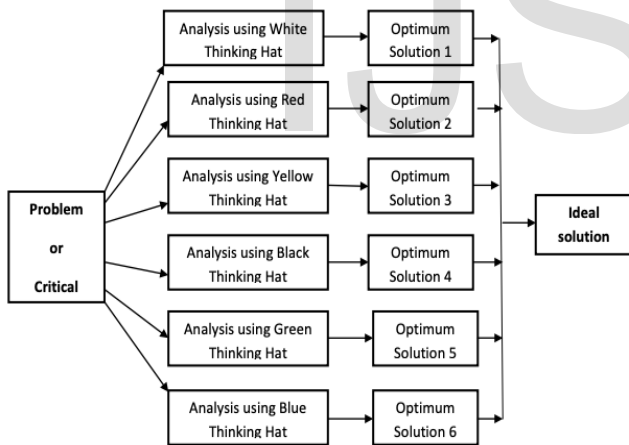


Fig. 2. Interpretive prototype of De Bono’s STH Model for an ideal solution in critical situations

III. MY EXPERIMENT

In my experiment, I will work on this question: “*Why should I pursue MSc. In Data Science?*”. Before starting this experiment, we have to make sure every member in the meeting is wearing the same color hat at a time and discuss the issues until they have worked on all the different hat’s ideas and concepts. So, the details as per my experiment on specific hat is as follows:

- **Blue:** We are here to **discuss** why should I pursue my MSc. in Data Science? In order to test this statement,

we need all kind of aspects **to reach a final decision.** **In what sequence** should I arrange these aspects?

- **Green:** The **possible way to work this out** can be enrolling in a good University with a well-structured course curriculum and then working to achieve a practical knowledge of how things work in the Data Science industry.
- **White:** I understand the **fact** that Data Science is the recent trend and there are ample number of opportunities in the job market. The **missing information** here is the change in the number of opportunities due to COVID19 and it’ll be great if I can have a clear picture of the market during the pandemic. I can **extract this information** from the previous batches of same course or connecting someone through social sites.
- **Black:** It **may not work** as mastering the Data Science is next to impossible due to its vast concepts and a huge amount of domain knowledge is required. The **weakness** here was quitting my job in India and moving in into a completely new country, Ireland that too in a situation where everything was hazy.
- **Red:** I am **getting** many opportunities to apply my technical competencies with a better level of study here in Ireland. Till now the **overall reaction** to my choice of domain has been splendid and I am really enjoying my time here.
- **Yellow:** It **will work** as it will open the doors of a highly paid career with a versatile field. Also, there won’t be any repetitive tasks which will keep me engaged in the work profile. The **primary advantage** of being a Data Scientist is that, they are at respectable positions in any organizations due to their critical decisions skills which are beneficial for the growth of the company.

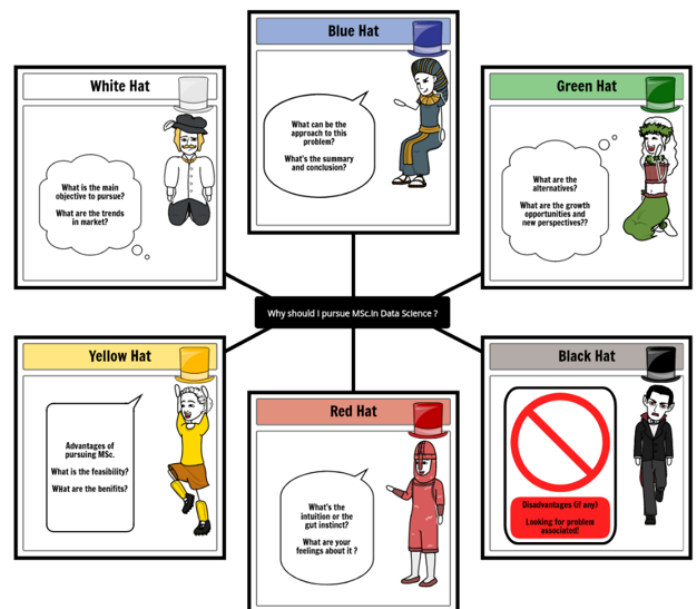


Fig. 3. Storyboard of my experiment with Six Thinking Hats technique

IV. REFLECTIONS

The goal of this paper was to reflect on the use of Six Thinking Hats, and to explore scenarios where it can be used effectively. To this end, Six Thinking Hats was first explained, then two papers that use it were discussed, as well as my own experiment using this technique.

My key reflections on this technique are as follows:

- This technique is very effective to assimilate parallel thinking with respect to our problem statement.
- It enumerates a well-defined structure to any thinking process.
- It may (sometimes) reduces conflicts between various groups/teams. However, in some situation people having different perspective may have strife.
- It adds on various criteria which emboldens creative thinking.
- The technique however may be time-consuming.
- To conclude, human beings based on their precedent experiences and the way to think towards a situation, they may have biased conceptions and applying this technique will definitely develop our reasoning skills which further will lead to better decisions.

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