

APPLIED OF CONCEPT MAPPING IN FOSTERING OF PROBLEM SOLVING SKILLS

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Abstract: Problem solving is one of the most important responsibilities of managers which have a significant impact on the efficiency of their performance. To make better decisions, several techniques have been developed and devised, one of which is using de Bono's six thinking hats. Furthermore, concept maps are graphical tools for organizing and representing knowledge to facilitate remembering and memorizing. The goal of this article is to combine de Bono's technique with concept mapping method and lecture method for finding better one to improve problem solving process in managers' minds. According to the goal, two groups of 60 managers were selected in two groups. A Group exposed to problem solving with six thinking hats technique using concept mapping method and the other one was trained by lecture method. A questionnaire developed to assess managers' problem solving ability. An Independent-sample t-test was conducted to compare two managers' groups' scores before and after training by lecture and concept mapping methods. The test showed a significant improvement in managers' problem solving ability that was trained by concept mapping method vs. lecture method.

Keywords: concept mapping, problem solving, decision making

1 Introduction

Problem solving is one of the most important skills of managers. Commonly, they have to confront with issues that they are expected to find a solution. Gagne (1966) defined problem solving as choosing a rule from probable rules. He stated that in the process of problem solving, learners make a decision to choose a rule and apply it in finding new solutions. Based on his theory we can consider problem solving as a kind of decision making. Stoyanov (2001) found that problem solving techniques to a large extent depend on the creativity and knowledge of the people and determine their problem solving style. Quillian (1968) claimed that the human memory is organized through semantic networks and the semantic networks in memory are composed of nodes and links (technically called labeled relationships) connecting the nodes. People use several techniques in decision making and problem solving among which is visualizing the variables with decision tree (Whiteley, 2005), using diagrams (Novak, 1990), cognitive flexibility hypertext (Spiro and Jehng, 1990), questions prompts (Ge and Lang, 2004, King, 1991) and concept mapping (Ott, 2001). Concept mapping can be useful in two ways: Firstly, it can be used as a strategic cognitive tool assists the manager to understand and organize information. (Novak, Gowin & Johnsen, 1983) Secondly, as a strategic metacognitive tool provides the ability for managers to effectively control and monitor recognition process. (Jegade, Alaiymola & Okebukola, 1990; Trowbridge & Wandersee, 1994).

Six thinking hats is a simple and effective parallel thinking process that makes it possible for the people to be more productive, focused and mindfully involved. Using this technique, people learn how to separate thinking into six distinctive functions and roles. Each hat represents a thinking role. By mentally wearing each hat they accept new role and can easily focus redirect thoughts (de Bono, 2013a). In this model, the white hat represents information known or needed. "The facts, just the facts." Wearing white hat we have to answer these questions: What information is available? What information would we like to have? What information do we need? What information is missing? How can we obtain the missing information? The yellow hat symbolizes brightness and optimism. Under this hat people explore the positives and probe for value and benefit. These are common questions that one has to answer while wearing the yellow hat. Who might benefit & how? To what extent (significant vs. moderate) and over what time frame (immediate vs. long term) that person might benefit and why? The black hat is negative judgment. Wearing this hat, one should spot the difficulties and dangers. Questions that are usually framed are: What does not fit? What are faults (potential problems or errors of logic), weaknesses and impracticalities? The red hat signifies feelings and intuition. When using this hat one can express emotions and feelings and share fears, likes, dislikes, loves, and hates. Typical questions are: What are my feelings about this problem? Do I like or dislike it? The green hat focuses on creativity; the possibilities, alternatives, and new ideas. It's an opportunity to express new concepts and new perceptions. Usually these questions are made: What are alternatives to the solution? What are other possibilities? The blue hat is used to manage the thinking process. It is the control mechanism that ensures the six thinking hats guidelines are

observed. To apply this hat the following questions may be raised: What are the advantages and disadvantages of each solution? What is the best one? (de Bono, 2013b).

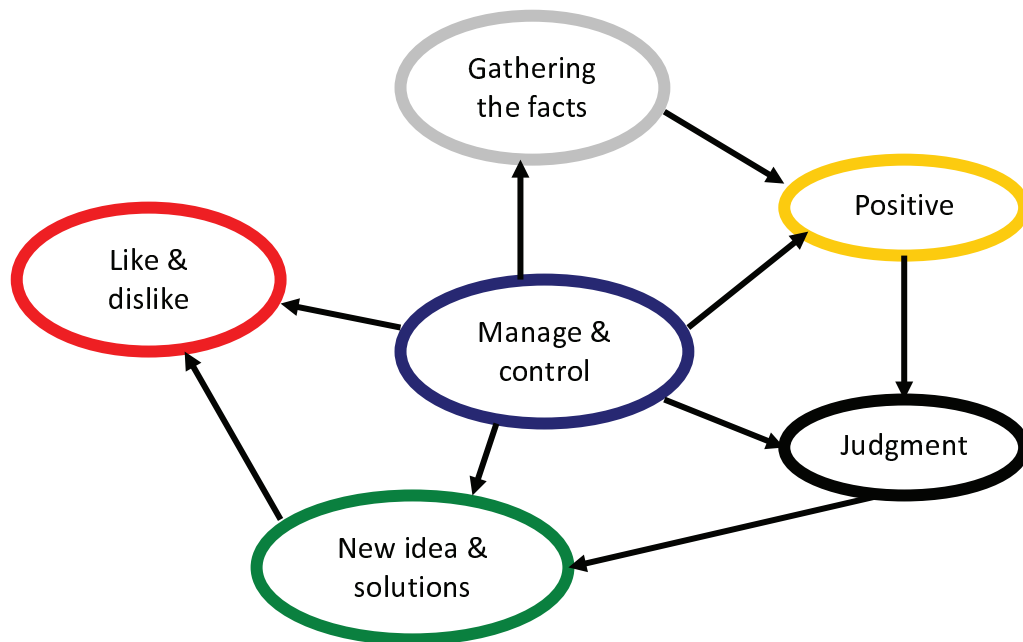


Figure 1. Six Thinking Hats, de bono, 2013.

2 Methods

To evaluate the effectiveness of training concept mapping on managers' ability in decision making using six thinking hats, two groups of 60 managers were selected from Cultural Heritage Organization in Iran and took part in our experiment. Then a thirty item questionnaire was developed to evaluate of managers' ability in decision making.

Later, its validity was evaluated and confirmed by a testing expert. The questionnaire was used to assess managers before and after a decision making using concept mapping training as pretest and posttest. For the second group we utilized the lecture method to train managers and improve their ability in decision making.

3 Result

An Independent-sample t-test was conducted to improve managers' ability in decision making by lecture method vs. concept mapping method. There was a significant difference in the scores for lecture ($M=11.00$, $SD=2.65$) method and concept mapping ($M=13$, $SD=2.75$) method; $t(58)=2.86$, $p = .006$. These results suggest that the concept mapping method training really does have a positive and significant effect on managers' ability in making better decisions. In other words, concept mapping technique instruction improves managers in problem solving.

4 Conclusion

This study provides an additional insight into prior research conducted in effect of concept mapping method vs. lecture method on managers' ability in decision making. The findings reveal that concept mapping has a noticeable impact on managers and their management power. According to research, managers who train with concept mapping methods can make decision better than other one who educate with lecture method.

In summary, this study indicates that concept maps can effectively promote learning of managers and thus, can be use for improve decision making skills.

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