Original Research Article

What It Means to Put Your Thinking Hat On: Six Thinking Hats to Enhance Creativity

ABSTRACT

Aims: To assess the effect of 'Six Thinking Hats' training on creativity among adolescents.
Study design: Pre-post experimental control group design was used.
Methodology:200 participants were included (50 control group; 150 experimental group; age range 16-18 years) from different schools of Patiala and Sangrur using incidental sampling. The participants of the experimental group were given intervention over 4 weeks.
Results: The results revealed that participants in the experimental group exhibited higher levels of creativity (M = 30.62) compared to the control group (M = 25.24). The intervention had a significant effect on creativity, as indicated by the statistically significant difference between the experimental and control groups [F (1, 198) = 42.11, *P*< .001].
Conclusion: The 'Six Thinking Hats' training yielded a statistically significant enhancement in creativity among the participants in the experimental group.

Keywords: Six thinking hats; creativity; adolescents.

1. INTRODUCTION

Creativity plays a crucial role in generating new and valuable ideas, tasks, and unique talents, which ultimately contribute to societal and cultural dimensions. It has been recognized as essential for physical and psychological well-being, optimal human functioning, and technological advancements [1-4]. Educational institutions have a responsibility to equip students with the necessary skills for creativity and actively promote its development. The revised Cognitive Model of Bloom [5] places creativity as the highest objective of instruction, highlighting the importance of schools prioritizing the promotion and nurturing of children's creative abilities.

The significance of developing critical thinking and creative problem-solving skills in children cannot be overstated. As children mature, they quickly realize that not all problems have straightforward solutions, and the ability to think creatively becomes vital in navigating challenges that require innovative approaches. This holds true in academic settings where students are expected to find optimal solutions to problems, as well as in personal life situations where critical thinking skills are necessary for making informed decisions.

These skills take on particular importance in preparing children for the future workforce, where employees across all industries will be tasked with developing solutions for problems that have yet to emerge. Instead, employees must apply critical thinking and creative problem-solving skills to discover effective solutions to new and unprecedented challenges.

By fostering critical thinking and creative problem-solving skills in children, we can equip them with the necessary tools to tackle the ever-changing challenges of the future.

Over the past century and a half of psychological research, scholars have recognized the significance of cognitive processes like creativity, which are closely intertwined with emotions and volition [6]. Guilford [7] emphasized that creativity entails both originality and effectiveness, asserting that new ideas must also be practical and acceptable. Guilford's seminal work on creativity laid the groundwork for scientific investigations in the field, and although his definition of "the abilities that are most characteristic of creative people" may not be an exact one, it sheds light on early understandings of the concept [8]. Given the critical nature of today's global challenges, researchers and practitioners in creativity should grasp the historical foundations of their field and push its development forward.

Creativity is a complex and multifaceted concept that researchers have defined in various ways. Torrance [9] described creativity as a process involving sensitivity to problems, identification of challenges, search for solutions, hypothesis testing, and communication of findings. While Ausubel [10] criticized Torrance's definition for lacking specificity and substantiality in delineating creativity as a distinct and significant ability, it still contributes to our overall comprehension of the concept. Nevertheless, there remains a lack of consensus among researchers regarding the definition of creativity [11-13]. Creativity takes on diverse forms and is influenced by a complex interplay of multiple factors, making its definition challenging. Additionally, creativity is often used interchangeably with terms like innovation, imagination, talent, and genius, but each term carries distinct meanings that researchers have made little effort to clarify [14]. The lack of consensus regarding the definition of creativity can be attributed to its diverse manifestations and the intricate interplay of multiple factors.

Despite the ongoing lack of consensus on its precise definition, one thing remains clear: creativity is a complex and multifaceted concept influenced by a multitude of factors. These outcomes can range from abstract actions such as the communication of emotions, the provocation of new ways of thinking, or the development of fresh perspectives on experiences, to concrete results such as the creation of aesthetically pleasing or imaginative works, the design and construction of improved or innovative devices, machines, buildings, or structures, the enhancement of processes or systems, increased operational efficiency, or even the advancement of profits and the preservation of national security. The importance of creativity in our society is undeniable, as it serves as a driving force behind innovation and progress across diverse fields [15]. The study of creativity has evolved over the past century and a half, emphasizing the intricate relationship between cognitive processes, emotions, and volition. Researchers have offered diverse definitions, highlighting the multidimensional nature of creativity and its connection to problem-solving and self-expression. While a consensus on its exact definition remains elusive, scholars agree on its complexity and the multitude of factors that influence it. Creativity extends beyond traditional artistic realms and holds significant value in various domains, driving innovation and advancement across industries. As researchers and practitioners continue to explore and develop the field of creativity, an understanding of its historical foundations and its diverse manifestations becomes essential for addressing the challenges of our rapidly evolving world.

Defining creativity comprehensively poses a formidable challenge due to several unresolved issues within the field. Scholars hold differing perspectives on the threshold for genuinely creative levels of achievement. The creative process involves various cognitive processes such as selective encoding, selective combination, and selective comparison, but a consensus on its complete workings remains elusive. Alongside the person-process debate,

there is another group of researchers who emphasize the evaluation of the creative product itself [16-17].

When examining a creative product, scholars generally agree on two main aspects: novelty and appropriateness. Rothenberg [18] defines creativity as the production of something new and genuinely valuable, while Mayer [19] describes it as the creation of new and useful products, including ideas and concrete objects. Sternberg et al. [20] define creativity as the ability to produce work that is novel, high in quality, and appropriate. Although most researchers recognize the importance of originality, defining it precisely proves challenging as novelty encompasses varying shades and degrees. Additionally, novelty can be defined at different levels, such as being original for the creator, a limited group, or society as a whole [20-22, 18-19]. Therefore, while there is a consensus on the two-fold definition of creativity, complete unanimity remains elusive.

Defining creativity presents ongoing challenges that researchers have attempted to tackle despite the inherent complexities and debates in the field. Gardner [23] sought to incorporate multiple aspects by defining creativity as the ability to consistently solve problems, generate products, or pose new questions within a domain in a way that is initially considered novel but ultimately becomes accepted in a particular cultural context. Nonetheless, the definition of creativity remains elusive due to the diverse nature of the questions posed by researchers [24]. To minimize confusion, researchers must clarify their conceptualization of creativity, and their findings should be interpreted in light of their specific perspective.

Although a broad consensus exists regarding the bipartite definition of creativity, complete unanimity is yet to be achieved due to the variation in the emphasis placed on different aspects of creativity, such as novelty, appropriateness, and impact, which may vary across domains [25].

One such solution is the Six Thinking Hats technique, developed by psychologist Bono, which assists individuals in breaking down problems into manageable steps. While numerous problem-solving techniques and strategies exist, the Six Thinking Hats technique stands out as the primary method for effectively structuring and dissecting problems. Edward de Bono, a renowned expert in creative thinking, innovation, and the teaching of thinking as a skill, developed this technique based on an understanding of how the brain processes information. Despite its simplicity and practicality, the Six Thinking Hats technique is utilized by individuals of all ages and professions and has proven to be effective.

In the early 1980s, Dr. Edward De Bono [26] introduced the 'Six Thinking Hats' (STH) technique as a framework for thinking that enhances and organizes individuals' thought processes while facilitating more effective decision-making. The different-colored hats of the STH method allow individuals to concentrate their thinking and overcome obstacles to practical thinking. As a simple and practical way of structuring and developing thinking skills, the Six Thinking Hats technique is a valuable teaching tool in the learning process.

By employing the Six Thinking Hats method, learners can direct their thinking toward specific focus areas for a designated duration, subsequently making notes. The Six Thinking Hats technique is a valuable thinking tool for empowering children to think independently and can be applied to numerous situations that require brainstorming, problem-solving, creative thinking, and lateral thinking. Its significance lies in providing a practical method for constructive thinking and fostering creativity across diverse thought processes. One such approach is the Six Thinking Hats, which encompasses different perspectives of thinking and aids learners in analyzing topics, problems, or situations in a systematic, objective, and creative manner.

The hats allow thinkers to focus on one type of thinking at a time and provide a visually memorable image that facilitates learning and application. This strategy can be utilized at different levels of critical and creative thinking, fostering the development of problem-solving, decision-making, leadership, and independent thinking skills. By employing the Six Thinking Hats, learners can engage in more confident and thoughtful thinking, organizing their ideas and attaining a deeper understanding of complex issues. The Six Thinking Hats technique is a valuable tool for individuals and teams to approach problems and situations from various perspectives. Following a sequential hat-based approach enables a comprehensive examination of a problem, reducing confusion and maintaining focus throughout the thinking process.

The Six Thinking Hats Technique proves to be a valuable tool that facilitates the development of both parallel and lateral thinking skills. Rooted in the concept of parallel thinking, this technique involves segmenting individual or group thinking into distinct perspectives, leading to enhanced efficiency and effectiveness. By providing a structured framework, this technique enables the systematic generation of fresh and innovative ideas within a non-critical and non-confrontational environment. The technique employs six metaphorical hats, each symbolizing a different facet of thinking, to stimulate insights and ideas individually. Subsequently, the ideas generated under each hat are harmoniously combined to foster creative problem-solving. Consequently, the Six Thinking Hats Technique offers a comprehensive and effective approach to thinking, encompassing elements of parallel thinking, lateral thinking, and creative thinking. These hats, namely Black, Blue, Green, Red, White, and Yellow, embody various modes of approaching and analyzing problems, each contributing to the problem-solving process in a specific way.

The blue hat actively manages cognitive processes to facilitate reaching a solution. The green hat represents thinking creatively and innovatively, fostering the development of novel solutions. Within red hat thinking, individuals can freely share their emotions, intuitions, and intuitive ideas related to problem-solving approaches without the need for elaborate explanations. The white hat emphasizes the acquisition of information necessary to solve the problem. The yellow hat brings optimism and determination to the problem-solving process.

The Six Thinking Hats model allows individuals to employ a specific type of thinking until its utility is exhausted, seamlessly transitioning to another type. These hats provide a framework for understanding different aspects of thinking and facilitate learning about diverse thinking approaches. De Bono [27] states that the 'Six Thinking Hats' method was developed to foster collaborative thinking, eliminate confusion, generate focus and synergy, and achieve powerful results. The Six Thinking Hats method allows for the separate consideration of different aspects of thinking instead of tackling everything at once. By prompting thinkers to engage in specific types of thinking, individuals can overcome their biases and approach ideas more objectively. The objective is to present considerations under each hat, fostering an environment where individuals learn to accept alternative perspectives and objectively examine issues, problems, or ideas. The Six Thinking Hats method serves as a neutral procedure, facilitating easy transitions between different modes of thinking and enabling requests for specific types of thinking.

There is now a growing emphasis on the development of interventions designed to enhance or facilitate desirable skills and qualities. In particular, attention has been given to fostering creativity through training programs like the 'Future Problem Solving Program International' [28], the 'Creative Capacity Building Program' [29], and the technique of 'Brainstorming' [30]. Among these endeavors, De Bono's 'six thinking hats' strategy has emerged as a promising approach, offering potential benefits in fostering both creativity and critical thinking skills.

De Bono [31] emphasizes the importance of lateral thinking in fostering creativity, particularly within the realm of the green hat, and suggests that its effectiveness can be enhanced through the implementation of the Six Thinking Hats technique. This approach has been utilized by numerous companies, including Motorola, to cultivate innovative ideas and develop superior products. A study conducted by Gonzalez [32] examined the effectiveness of the six thinking hats and found that it enhances creativity, foster innovation, and promote collaborative thinking. The majority of students reported that this method improved their ability to empathize with patients, generated creative ideas, and expanded their thinking.

Research has shown that creativity can be enhanced through explicit training [33]. Azeez [34] conducted a study demonstrating that the six thinking hats technique significantly improved participants' innovative competence. The results indicated that the experimental group outperformed the control group on the innovative competence scale, suggesting that the training had a positive impact. These findings support the notion that the six thinking hats technique is both learnable and applicable in the workplace, leading to better outcomes. Ramalingam [35] described the benefits of using the six thinking hats as a teaching strategy, including allowing students to express their perspectives on an issue and stimulating diversity and creativity in thinking.

The wide range of studies and contexts explored in the literature highlights the versatility and effectiveness of the six thinking hats approach, indicating its relevance in various educational and professional settings. The ability to think and address unexpected circumstances in life with innovative solutions is of utmost importance. Adolescents, who are constantly surrounded by various activities and situations, particularly require the teaching of thinking skills. The 'Six Thinking Hats' strategy is a valuable approach that teaches thinking and problem-solving by considering multiple perspectives. Through Six Thinking Hats training, adolescents have the opportunity to develop creativity.

2. METHODOLOGY

2.1 Sample Size

The study collected objective data from a sample size of 200 subjects within the age range of 16-18 years from different schools of Patiala and Sangrur using incidental sampling. Consent of the respective school principals and participants were taken in advance. Among these participants, 150 were assigned to the experimental group, while the remaining 50 were assigned to the control group using the fishbowl draw method.

2.2 Procedure

For the present research the pre-post experimental control group design was used. The research comprised of the following three phases:

In the first phase, pre-intervention scores were obtained from the subjects in the experimental and control group by administering all the questionnaires via online platform, which are, The Cornell Class Reasoning Test [36], The Torrance Tests of Creative Thinking [37], The Problem Solving Inventory [38], Metacognitive Awareness Inventory [39] and The Creative Cognition Inventory [40].

In the second phase, training was imparted to the subjects in the experimental group by using an online medium, based on the six thinking hats model. The intervention phase included 11 sessions, focusing on activities involved under each hat that helped develop an

understanding of the dynamics of all the thinking modes involved. Participants of the experimental group were divided into 25 groups. Training was conducted in groups of 6 participants, having 3 sessions per week.

In the third phase, post-intervention scores were obtained from the subjects in the experimental and control group by re-administering all of the above mentioned questionnaires through an online channel.

2.3 Statistical Analysis

To analyze the impact of independent variable on the dependent variables, one-way repeated measures ANOVA was applied.

3. RESULTS AND DISCUSSION

Table 1 displays that the participants in the experimental group were found to be high on creativity (M = 30.62) as compared to participants in the control group (M=25.24). The effect of the intervention was found to be significant for creativity as the difference between the experimental and control groups came out to be statistically significant [F (1, 198) = 42.11, *P*<.001]. In terms of verbal fluency of creativity, the participants in the experimental group demonstrated significantly higher levels (M = 15.93) compared to those in the control group (M = 13.14). These findings suggest that the intervention had a notable impact on enhancing verbal fluency of creativity, as evidenced by the statistically significant difference observed between the experimental and control groups [F (1, 198) = 39.92, *P*< .001]. Moreover, the participants in the experimental group demonstrated significantly higher levels of verbal originality in creativity (M = 1.20) compared to the control group participants (M = 0.76). These findings provide strong evidence for the effectiveness of the intervention, as the statistically significant difference observed between the experimental and control groups [F (1, 198) = 8.70, *P*< .001] highlights the significant impact on enhancing verbal originality of creativity. Furthermore, a significant discrepancy emerged in the verbal flexibility scores of creativity between the experimental group (M = 13.49) and the control group (M = 11.20), signifying the presence of elevated levels of verbal flexibility among participants in the experimental group. This statistically significant difference further emphasizes the substantial impact of the intervention on fostering verbal flexibility of creativity [F (1, 198) = 39.95, *P*<.001].

Table 1. Comparison of the control and experimental group on post-intervention scores for creativity

		Intervention				
Variables		**ControlGroup (n=50)**		**Experimental (n=150)**	**Group**	**F-ratio**
		Means	**SD**	**Means**	**SD**	
Creativity		25.24	4.70	30.62	5.20	42.11**
Verbal (Creativity)	Fluency	13.14	2.63	15.93	2.73	39.92**
Verbal (Creativity)	Originality	0.76	0.59	1.20	1.00	8.70**

Verbal (Creativity)	Flexibility	11.20	2.30	13.49	2.19	39.95**

**$P < .001$

The implementation of the 'Six Thinking Hats' training program yielded notable and statistically significant improvements in creativity among the participants in the experimental group. This training fostered a creative mindset, empowering individuals to approach challenges with a fresh and inventive perspective, ultimately resulting in a substantial enhancement of their creative abilities.

Several researchers have highlighted the explicit framework provided by the 'Six Thinking Hats' technique, which facilitates creative thinking [41-42]. The benefits of six thinking hats on critical thinking, known for its flexible and deep thinking qualities, further support its potential for enhancing flexible and deep ideas, the two pathways to creativity [43-44]. The ability to shift between the perspectives of the six hats encourages diverse viewpoints and processing approaches, facilitating creativity. This aligns with previous research suggesting that shifting perspectives fosters idea development and aids creativity [45-46].

The effectiveness of the six thinking hats approach in enhancing creativity and promoting collaborative thinking has been evidenced in the study conducted by Gonzalez [32]. Furthermore, the application of the six thinking hats model in a surgical nursing class by Karadag et al. [47] elicited positive feedback from students, who reported increased empathy towards patients, generation of creative ideas, and the development of their thinking systems. Altıkulaç and Akhan [48] also emphasized the applicability of the Six Thinking Hats technique, highlighting its ability to enhance creativity in students.

Recent research by Vernon and Hocking [49] examined the impact of the six hats technique on creativity, revealing increased scores in both fluency and originality compared to the control condition.

4. CONCLUSION

In conclusion, the findings of this research support the effectiveness of six thinking hats training in enhancing various aspects of creativity, specifically verbal fluency, verbal originality, and verbal flexibility among participants within the age range of 16 to 18 years. The results demonstrate the potential of this training approach to stimulate innovative thinking and encourage the generation of diverse ideas. These findings contribute to the growing body of literature on creativity training interventions and highlight the importance of incorporating structured techniques, such as the six thinking hats, to foster creative thinking abilities in young individuals. Further research could explore the long-term effects of this training and its applicability across different age groups and contexts, to fully grasp its potential as a valuable tool in promoting creativity.

CONSENT

The participants were informed about the research study. Theconfidentialityof the information was assured and informed consent was also obtained from the participants.
The participants were informed about the research study and that the data may be used for publications. The confidentiality of the information was assured and informed consent was also obtained from the participants.

REFERENCES

1. Boden MA. The creative mind: myths and mechanisms. London: Weidenfield and Nicholson; 1990.
2. Dudek SZ. Art and aesthetics. In: Runco MA, editor. Creativity research handbook. Cresskill, NJ: Hampton Press; 2003.
3. Lubart TI. Creativity. In Sternberg RJ, editor. Thinking and problem solving. San Diego, CA: Academic; 1994.
4. Pennebaker JW, Kiecolt-Glaser JK, Glaser R. Disclosure of trauma and immune functioning: health implications for psychotherapy. In: Runco MA, Richards R, editors. Eminent creativity, everyday creativity and health. Norwood, NJ: Ablex; 1997.
5. Anderson LW, Krathwohl DR. A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. New York: Addison Wesley Longman; 2001.
6. Singer JL. Concluding comments: crossover creativity or domain specificity? In: Sternberg RJ, Grigorenko EL, Singer JL, editors. Creativity: From potential to realization. Washington, DC: American Psychological Association; 2004.
7. Guilford JP. Creativity. Am Psychol. 1950;5(9):444-454.
8. Runco MA, Jaeger GJ. The standard definition of creativity. Creativity Res J. 2012;24(1):92-96.
9. Torrance EP. Norms-Technical manual. Torrance's test of creative thinking. MA: Ginns and Co; 1974.
10. Ausubel D. The psychology of meaningful verbal learning. New York: Grune & Stratton; 1963.
11. Sternberg RJ, editor. Handbook of creativity. New York: Cambridge University Press; 1999.
12. Marksberry ML. Foundations of creativity. New York: Harper & Row; 1963.
13. Baker M, Rudd R, Pomeroy C. Relationships between critical and creative thinking. J South Agric Educ. 2001;51(1):173-88.
14. Plucker JA, Makel MC. Assessment of creativity. In: Kaufman JC, Sternberg RJ, editors. The Cambridge handbook of creativity. New York: Cambridge University Press; 2010. p. 48-73.
15. Amabile TM. A model of creativity and innovation in organizations. Res Organ Behav. 1988;10.
16. Kaufman JC, Baer J. Sure, I'm creative – but not in mathematics! Self-reported creativity in diverse domains. Empirical Stud Arts. 2004;22(2):143-55.
17. Sternberg RJ, Kaufman JC. Constraints on creativity: obvious and not so obvious. In: Kaufman JC, Sternberg RJ, editors. The Cambridge handbook of creativity. New York: Cambridge University Press; 2010. p. 467-82.
18. Rothenberg A. Creativity and madness: new findings and old stereotypes. Baltimore: The Johns Hopkins University Press; 1990.
19. Mayer RE. Fifty years of Creativity Research. In: Sternberg RJ, editor. Handbook of creativity. London: Cambridge University Press; 1999. p. 449-60.

20. Sternberg RJ, Kaufman JC, Pretz JE. The creativity conundrum: A propulsion model of kinds of creative contributions. Philadelphia: Psychology Press; 2002.
21. Mishra P, Henriksen D. A new approach to defining and measuring creativity: rethinking technology and creativity in the 21st century. TechTrends. 2013;57(5):10-3.
22. Runco MA. Creativity. Annu Rev Psychol. 2004;55:657-687.
23. Gardner H. Creating minds: an anatomy of creativity seen through the lives of Freud, Einstein, Picasso. Eliot, Graham, and Gandhi: Stravinsky. New York: Basic Books; 1993.
24. Plucker JA, Beghetto RA, Dow GT. Why isn't creativity more important to educational psychologists? Potential, pitfalls, and future directions in creativity research. Educ Psychol. 2004;39(2):83-96.
25. Lubart T, Guignard J. The generality-specificity of creativity: A multivariate approach. In: Sternberg R, Grigorenko E, Singer J, editors. Creativity: From potential to realization. Washington, DC: American Psychological Association Books; 2004. p. 43-56.
26. De Bono E. Six thinking hats. London: Penguin Books; 1985.
27. De Bono E. Six thinking hats. London: Penguin Books; 1999.
28. Torrance EP, Torrance JP, Williams SJ, Horng RY. Handbook for training future problem solving teams. Athens, GA: University of Georgia; 1978.
29. Hawthorne BA, Quintin EM, Saggar M, Bott N, Keinitz E, Liu N. Impact and sustainability of creative capacity building: the cognitive, behavioral and neural correlates of increasing creative capacity. In: Plattner H, editor. 4th ed. Design thinking research. Berlin, Germany: Springer; 2013. p. 1-21.
30. Osborn AF. Applied imagination: principles and procedures of creative thinking. New York: Charles Scribner; 1953.
31. De Bono E. Lateral thinking: creativity step by step. New York: Harper & Row; 1970.
32. Gonzalez D. The art of solving problems: comparing the similarities and differences between creative problem solving, lateral thinking and synectics. New York: International Center for Studies in Creativity; 2001.
33. Feldhusen JF, Clinkenbeard PR. Creativity instruction materials: a review of Research. J Creat Behav. 1986;20(3):153-82.
34. Azeez RO. Six Thinking hats and social workers' innovative competence: an experimental study. In: Journal of education and practice. 2016;7(24):149-53.
35. Ramalingam B. Tools for Knowledge and Learning: A guide for development and humanitarian organisations. London: Overseas Development Institute; 2006.
36. Ennis RH, Gardiner WL, Morrow R, Paulus D, Ringel L. The Cornell Class reasoning test. Champaign, IL: Illinois Critical Thinking Project; 1964.
37. Torrance EP. The Torrance Tests of Creative Thinking: norms-technical manual figural (Streamlined) Forms A & B. Bensenville, IL: Scholastic Testing Service, Inc; 1990.
38. Heppner PP. The problem solving inventory. Palo Alto, CA: Consulting Psychologist Press; 1988.
39. Schraw G, Dennison RS. Assessing metacognitive awareness. Contemp Educ Psychol. 1994;19(4):460-75.
40. Holt NJ. Creativity and boundary permeability. Northamptonshire, UK: University of Northampton; 2002.
41. Rivzi AA, Bilal M, Ghaffar A, Asdaque M. Application of six thinking hats in education. Int J Acad Res. 2011;3(3):775-80.
42. Schellens T, Van Keer H, De Wever B, Valcke M. Tagging thinking types in asynchronous discusson groups: effects on critical thinking. Interact Learn Environ. 2009;17(1):77-94.

43. Baas M, De Dreu CKW, Nijstad BA. A meta-analysis of 25 years of mood-creativity research: hedonic tone, activation, or regulatory focus? Psychol Bull. 2008;134(6):779-806.
44. Nijstad BA, De Dreu CKW, Rietzschel EF, Baas M. The dual pathway to creativity model: creative ideation as a function of flexibility and persistence. Eur Rev Soc Psychol. 2010;21(1):34-77.
45. Basadur M, Graen GB, Green SG. Training in creative problem solving: effects on ideation and problem finding and solving in an industrial research organisation. Organ Behav Hum Perform. 1982;30(1):41-70.
46. Kozbelt A, Beghetto RA, Runco MA. Theories of creativity. In: Kaufman JC, Sternberg RJ, editors. The Cambridge handbook of creativity. Cambridge, UK: Cambridge University Press; 2010. p. 20-47.
47. Karadag M, Saritas S, Erginer E. Using the 'six thinking hats' model of learning in a surgical nursing class: sharing the experience and student opinions. Aust J Adv Nurs. 2006;26(3).
48. Altıkulaç A, Akhan NE. The effect of using the creative drama method and the six thinking that technique on student success and attitudes in eighth-grade revolution History and Kemalism lesson. AHI Evran Univ J Kırşehir Educ Fac. 2010;11(3):225-47.
49. Vernon D, Hocking I. Thinking hats and good men: structured techniques in a problem construction task. Thinking Skills Creativity. 2014;14:41-46.