



# EFFECT OF METACOGNITION BASED LEARNING PROGRAM ON THE CREATIVE THINKING SKILLS OF PRIMARY SCHOOL STUDENTS

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**Abstract:** *The main purpose of this research is to examine the effect of the Metacognition Based Learning Program (MLP) on creative thinking skills of primary school students. For this purpose, “Experimental Model with Pretest – Posttest Design” was used in the research. The study group of the research consists of 35 fourth grade students studying at Creative Public School, Palakkad district, Kerala in the 2023-24 academic year. Experimental (n=35) group was chosen within the scope of the research. MMP was developed with Metacognition strategies, Mindfulness and Mnemonic techniques. The prepared program was implemented for 8 weeks. Two weeks of the program was conducted for the development of Creative Thinking Skills. The data of the study were collected through Achievement tests (pretest and posttest). The t-test was conducted to determine whether there was a difference between pre and post-tests. As a result of the research, a significant difference was found in terms of creative thinking skills of fluency, flexibility, originality and elaboration, prior to and after conducting the study. In this respect, it is seen that the MLP has a positive effect on Creative Thinking skills.*

**Keywords:** *Metacognition based Learning Program; Creative Thinking Skills; Primary School Students.*

## 1. INTRODUCTION:

The Metacognition and creativity are two important cognitive processes that play significant roles in human thinking and problem-solving. In the world of education, Metacognition is an emerging word gaining much popularity and importance. Metacognition means ‘thinking about thinking’. Flavell (1976) defined metacognition as referring to one’s knowledge concerning one’s own cognitive processes and products or anything related to them, e.g., the learning-relevant properties of information or data. Creativity is recognized as an essential 21<sup>st</sup> century skill. “Torrance defined creativity as the process of sensing difficulties, problems, gaps in information, missing elements, something askew: making guesses and formulating hypotheses about these deficiencies; evaluating and testing these guesses and hypotheses; possibly revising and retesting them and finally communicating the results” (Bartscher et al. 2001). “Creative thinking can be regarded as a metacognitive process in which the combination of individual’s cognitive knowledge and action evaluation results in creation” (Jia et al., 2019). In the vibrant ocean of education, the interplay between metacognition and the cultivation of creative thinking skills among primary school students stands as an area ripe for exploration and innovation.

**Abbreviations and Acronyms :** MLP- Metacognition based Learning Program

## 2. LITERATURE REVIEW:

Hargrove (2012) conducted a study titled “Fostering creativity in the design studio: A framework towards effective pedagogical practices”. According to him, Design is a discipline of innovation: its essence is the creation of something new and unique. An assumption has been that the inclination and ability of a person to respond in novel and useful ways is largely inherited. Present research refutes this view, and it is now believed by many that, however creativity is defined,



it is a form of behaviour that can be taught. Acknowledging this point leads to the questioning of how creativity is situated in the design curriculum. If, as present research suggests, most creativity training programmes are successful in that they encourage the development of metacognitive abilities, then the study of creativity as a self-regulatory metacognitive process is timely and important to design education.

Miranti and Wilujeng (2017) conducted a study titled “Creative Thinking Skills Enhancement Using Mind Mapping”. The aim of this study was to determine the improvement of students' creative thinking skill. The method used is quasi experiment, with design of non-equivalent control group design. The results showed that mind mapping method can significantly improve students' creative thinking ability.

Tohir (2019) conducted a study on Students' Creative Thinking Skills in Solving Mathematics Olympiad Problems Based on Metacognition Levels. The research aims to describe the level of creative thinking ability of students in solving mathematics olympiad problems based on students' metacognition levels by using the qualitative descriptive approach. The results exhibited that the level of creative thinking skills of the students in solving mathematics Olympiad questions were 29.41% (less creative), 41.18% (quite creative), 11.76% (creative) and 17.65% (very creative). On the other hand, the metacognitive level of SMPN 2 Jember students were 64.71% at level 2 (aware use), 23.53% at level 3 (strategic use) and 11.76% at level 4 (reflective use). In addition, the literatures indicate that there are several factors affecting the creative thinking skills and metacognition level, among them is an understanding of the information of the problem, compiling an appropriate strategies, skills of the chosen strategy, skills of answer elaboration, mastery of the Mathematics Olympiad material and a tendency to rely on the memorization or imitations based on previous or discussed solutions.

Yusnaeni et al. (2020) conducted a study on the Contribution of Metacognitive Skills and Creative Thinking Skills in 21st Century Learning. It was a correlational research related to the multiple correlation between metacognitive skills and creative thinking skills with students' cognitive learning results. The research aimed at investigating the contribution of metacognitive skills and creative thinking skills simultaneously on the cognitive learning results of 226 senior high school science students of Kupang, Indonesia. The results of the research showed that metacognitive skills and creative thinking skill simultaneously had a high contribution on students' cognitive learning results as much as 62.78%. Based on this result, teachers need to empower students' metacognitive skills and creative thinking skills in learning because both thinking skills are required in 21st century.

### **3. Need and Significance of the Study**

The significance of this study exceeds the traditional boundaries of education, resonating deeply with the soul of nurturing adaptable, creative minds. Understanding the symbiotic relationship between metacognition and the development of creative thinking skills among primary school students offers a paradigm shift in educational practices. It not only enriches their academic experiences, but also equips them with the cognitive tools to navigate the complex landscape of innovation in an ever-evolving world. This exploration holds the ability to revolutionize the pedagogical approaches, empowering the educators to tailor teaching methods that foster not only academic excellence, but also the divergent and inventive thinking vital for success in the dynamic challenges of the future. “Metacognitive experiences are more important in the generative stage of creativity, whereas metacognitive knowledge is more influential in the exploratory stages” (Preiss, D. D., 2022)

### **4. Objective:**

To find out whether there exists any positive effect of Metacognition based Learning Program (MLP) on Creative Thinking Skills of fourth standard students in Kerala

#### **4.1 Hypothesis:**

There is a positive effect for Metacognition based Learning Program (MLP) on Creative Thinking Skills of fourth standard students in Kerala

### **5. Methodology of the Study**

#### **Method**

In this study, the effect of Metacognition based Learning Program (MLP) on the creative thinking skills of primary school students was investigated according to quantitative design. “Quantitative Research establishes statistically



significant conclusions about a population by studying a representative sample of the population” (Lowhorn, G. L., 2007). The model of the research is Experimental Model. It was tested whether the independent variables (activities within the MLP) were effective on the dependent variable (creative thinking skill). In the pretest- posttest experimental group model, there is one group, the experimental group. Within the scope of the research, 35 students from the 4th grade students studying at Creative High School in the Palakkad district were included. The groups were given a pre-test before the experimental application and a post-test after the application.

### Study Group

The study group (n=35) of the research consists of 4th grade students studying at Creative High School in the Palakkad district of Kerala. The data, which are thought to serve the purpose of the research, were collected through Achievement tests.

**Table 1**

#### *Research Design*

<b>Group</b>	<b>Pre-test</b>	<b>Treatment</b>	<b>Post-test</b>
Experimental Group	X1	E	X2

Note.

X1: Pre-test in Experimental class

E: Treatment using MMP

X2: Post-test in Experimental class

### Data Collection Tools

Creative thinking Skills Test: The “Creative Thinking Skills Test”, developed by Anees & Zeenath (2022) consists of 12 questions. The tool was administered among 100 fourth standard students and Item Analysis was done. The final tool consisted of 10 questions. In order to ensure the Reliability of the test, 2 methods were adopted: Test-retest method and Cronbach’s alpha to ensure internal consistency and thus the reliability was ensured. The Face Validity and Content Validity was ensured by a panel of 5 experts consisting of 3 educationists and 2 primary teachers. Thus the Creative Thinking Skills Test was standardised.

MLP: In order to standardise the Metacognition based Learning Program (MLP), the content and items of the Program was discussed with panel of 5 experts consisting of 3 educationists and 2 primary teachers. Based on their suggestions, appropriate modifications were made wherever necessary. A Rating Scale was given to the panel to ensure the content validity and face validity. They rated the program in the dimensions provided in the scale. Thus the Metacognition based Learning Program (MLP) was standardised.

### Data Collection

In this study, which was conducted to determine the effect of the Metacognition based Learning Program (MLP) on the creative thinking skills of primary school students, the program prepared with Metacognitive strategies, Mindfulness and Mnemonic techniques was applied to the experimental group students for 6 weeks, 5 hours a week. The suitability of the activities in the prepared program to the grade level was decided by taking the opinions of teacher educators and teachers.

In the first stage, a pre-test was conducted on the 35 students and their scores were recorded. In the next step, the MMP prepared within the scope of the research was started to be applied to the experimental group. The application was made in 30 hours. In the experimental group, the practice was continued for five days a week, one lesson per day, and continued for six weeks. Two weeks of the program were conducted for the development of Creative Thinking Skills. During the trainings, the motivation of the students was tried to be kept at a high level with verbal reinforcements. At the end of the 6-week period, posttest was applied and the scores of the Achievement test were recorded.



## Data Analysis

The data gathered from the investigation was analysed using the SPSS package application. In beginning, the normality test was run over the discrepancies between the pretest posttest findings collected within the scope of the research in order to decide which statistical data analysis types would be employed in the data analysis. The Mean, SD, skewness, and kurtosis coefficients, were investigated in this study to see if the data had a normal distribution. The tested values were found to be in the normal distribution ( $p < .05$ ). Since the data were in accordance with the normal distribution, t-test was used for the difference analysis of the paired groups, which is one of the parametric tests.

**Table 2**

*Descriptive Statistics*

	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
C1	35	4.5	30	15.44	6.24	.229	-.335
C2	35	18.5	34	28.08	3.86	-.57	-.454

**Table 3**

*Paired sample t-test Results Regarding the Pretest-Posttest Data of Experimental Group Creative Thinking Skills Scale*

Test	N	$\bar{x}$	SD	df	t	p
Pre-test	35	15.44	6.249	34	15.331	.000
Post-test	35	28.09	3.866			

## 6. Findings and Discussion :

The objective of the study is to find out whether there exists any positive effect of Metacognition based Learning Program (MLP) on Creative Thinking Skills of Fourth standard students in Kerala. The results can be seen as follow:

The t-test was used to determine if the difference between the means of both groups is significant. According to the test findings, there was a statistically significant difference between the groups in terms of creative thinking skills. According to the research, the influence of MLP on the creative thinking skills of fourth standard primary school students was found after the application. The changes in the students' results were found to be significant in the process.

According to the findings, the difference between the experimental group's pretest-posttest averages is significant and that the Metacognition based Learning Program (MLP) prepared with Metacognition strategies, Mindfulness and Mnemonic techniques were successful in establishing a considerable difference between pre-test and post-test scores. Thus, it can be concluded that the Metacognition based Learning Program (MLP) has a positive effect on creative thinking skills of fourth standard students.

## 7. Suggestions for further study:

The purpose of this study was to see how the Metacognition based Learning Program (MLP) affected the creative thinking skills of fourth standard students. The following proposals for future studies, researchers, and practitioners are based on the experiences gained during the study process and the findings collected as a consequence of the research:

1. The prepared program was implemented for 6 weeks. However, the duration of the program can be extended with the activities to be added in order to acquire good creative thinking habits permanently.
2. In this research, the research data were collected using Creative thinking Skills Test. Quantitative data were obtained with this tool. In a similar study, observations and interviews can be made to obtain the opinions of students and teachers about the program, and the study can be supported with qualitative data.
3. The program has been prepared considering the development level of primary school students. In a similar study, the effect of the program on creative thinking skills can be tested on different age groups with different activities to be added.



4. In future studies, students from regions with different socioeconomic variables can be studied.
5. The developed program can be easily applied by classroom teachers in the primary school period.
6. It is thought that this program, which has an infrastructure that parents can easily apply at home, will provide great support to students in primary schools.

#### REFERENCES :

1. Bartscher, M. A., Lawler, K. E., Ramirez, A. J., & Schinault, K. S. (2001). Improving Student's Writing Ability Through Journals and Creative Writing Exercises.
2. Flavell, J. H. (1976). Metacognitive Aspects of Problem Solving. In Resnick, L.B. (Eds.). *The Nature of Intelligence* (pp. 231-235). London: John Wiley & Sons.
3. Hargrove, R. (2012). Fostering creativity in the design studio: A framework towards effective pedagogical practices. *Art, Design & Communication in Higher Education*, 10(1), 7-31.
4. Jia, X., Li, W., & Cao, L. (2019). The role of metacognitive components in creative thinking. *Frontiers in psychology*, 10, 2404.
5. Lowhorn, G. L. (2007). Qualitative and quantitative research: How to choose the best design. In *Academic Business World International Conference. Nashville, Tennessee*.
6. Lubart, T. I., & Sternberg, R. J. (1998). Creativity across Time and Place: life span and cross-cultural perspectives. *High Ability Studies*, 9(1), 59–74. <https://doi.org/10.1080/1359813980090105>
7. Miranti, M. G., & Wilujeng, B. Y. (2017, September). Creative thinking skills enhancement using mind mapping. In *1st International Conference on Social, Applied Science and Technology in Home Economics (ICONHOMECS 2017)* (pp. 39-42). Atlantis Press.
8. Preiss, D. D. (2022). Metacognition, mind wandering, and cognitive flexibility: Understanding creativity. *Journal of Intelligence*, 10(3), 69.
9. Tohir, Mohammad. (2019). Students' Creative Thinking Skills in Solving Mathematics Olympiad Problems Based on Metacognition Levels. *Alifmatika: Journal of Mathematics Education and Learning*, 1(1), 1-14.
10. Yusnaeni, Y., Corebima, A.D., Susilo, H., & Zubaidah, S. (2020). The Contribution of Metacognitive Skills and Creative Thinking Skills in 21st Century Learning. *Universal Journal of Educational Research*, 8, 31-36.