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## THE EFFECT OF CREATIVE TEACHING TECHNIQUE TO CREATIVE PROBLEM-SOLVING ABILITY IN STUDENTS

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### Abstract

The focus of this study is increasing creative problem-solving study through creativity training programs for teacher trainee Tarbiya and Teaching Science. Results of previous research in relation to structured programs for fostering creative thinking and problem-solving abilities include the *Productive Thinking Program* (Covington, Crutchfield, Davies, & Olton, 1972), the *Purdue Thinking Skill Program* (de Bono, 1973, 1976, 1983). These studies investigated differences in student primary, elementary and high school creative thinking while this study investigates the creative teaching problem-solving in adult learner the PGMI (Teaching Trainee for Elementary). The experiment was conducted in first semester of the school year 2015/2016 of 2 September, 25 –December 2015. (The main objective of this study to answer the question whether teaching creative increase the ability of the teacher to respond to the varied challenges on their elementary student in a creative manner. The creative training program consisted of class discussion and also active stimulation creative problem-solving. The participant of this research is PGMI students age 19-20. Classes manipulate by teaching creative or student discussion. The result showed that experimental class increases creative problem solving then discussion class. The recommendation for teacher use teaching creative in the class room.

**Keywords:** teaching creative; creative problem solving

### Abstrak

Fokus pada penelitian ini adalah pembelajaran untuk meningkatkan pemecahan masalah secara kreatif melalui program pelatihan kreativitas untuk bidang ilmu Tarbiyah dan Keguruan. Hasil penelitian pratinjau dalam kaitannya dengan program yang terstruktur untuk meningkatkan pemikiran kreatif dan kemampuan memecahkan masalah, diantaranya yaitu Program Berpikir Produktif (Covington, Crutchfield, Davies, & Olton, 1972, Program Keterampilan Berpikir Purdue (deBono, 1973, 1976, 1983). Penelitian tersebut telah menginvestigasi perbedaan pemikiran kreatif pada siswa SD, SMP dan SMA sedangkan penelitian ini menyelidiki pengajaran pemecahan masalah pengajaran kreatif pada pelajar dewasa yaitu untuk PGMI (Pendidikan Guru Madrasah Ibtidaiyah). Percobaan ini dilakukan pada semester pertama tahun ajaran 2015/2016, 2 September- 25 Desember 2015. Tujuan utama penelitian ini yaitu untuk menjawab pertanyaan apakah pengajaran kreatif dapat meningkatkan kemampuan guru pelatih untuk merespon terhadap tantangan yang variatif pada siswa SD mereka secara kreatif. Program pelatihan kreatif terdiri dari diskusi kelas dan juga stimulasi aktif yang kreatif dalam pemecahan masalah. Peserta penelitian ini adalah siswa PGMI usia 19-20 tahun. Kelas dimanipulasi dengan pengajaran kreatif atau diskusi siswa. Hasilnya menunjukkan bahwa ada peningkatan pada kelas eksperimen dalam pemecahan masalah secara kreatif dibanding kelas diskusi. Direkomendasikan agar guru menggunakan pengajaran kreatif di ruang kelas.

**Kata kunci:** pengajaran kreatif; pemecahan masalah kreatif

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## Introduction

Several studies have been done related to problem-solving. For example Moshe F. Rubinstein 1975. In his book *Patterns of Problem solving* he explains that: Some psychologist describes the problem-solving process regarding a simple model that consists of these stages: preparation, incubation, inspiration, and verification. (Moshe F. Rubinstein 1975).

The result of research R.L Firestien, 1987, *Effect of creative Problem-Solving Training on Communication* that individual subject can perform better on some cognitive and affective evaluative measure. (R.L. Firestein, 1987). The ability to solve problems creatively is an essential element of success for individuals and organizations (Scott et al. 2004), in Joshua Fair Child, 2013. As such, a thorough understanding of this process would be immensely beneficial and is of paramount importance for enhancing performance on creative tasks, Joshua Fair Child, 2013.

So, training creative problem solving for student college very important. Because student does not know problem-solving process. Kuang-Chao Yu, 2013, studied about enhancing students problem-solving skills trough context-based learning present. They present presents a three-stage, context based, problem-solving, learning activity that involves watching detective films, constructing a context-simulation activity, and introducing a project design to enable students to construct a complete PSP.

## Thesis Statement

Creative problem solving can be improved with creative teaching training, by using brainstorming, analogy, and giving creative problem-solving.

Treffinger, 2004, stated that the most effective way of creative problem-solving model

(Treffinger, 1980) should involve children in thinking divergently (thinking creatively, while convergent is thinking critically) in using five steps: 1. *Fact Finding*, 2. *Problem Finding*, 3. *idea Finding*, 4. *Solution Finding* ( idea Evaluation), and 5. *acceptance finding* (idea implementation). Those steps are designed for grown up people, junior high school, and elementary students (Treffinger 2004).

There are some problems related to it, for example, children are not used to think creatively, either at home or in school. Parents not allow children to think creatively and rather to use authoritative parenting style. For example, cooking with a traditional recipe. The same condition also happen in school in which teachers use memorizing technique in school and multiple-choice assessment. This condition gives traces to students and will be brought until university level. Does is it possible to teach creativity to those who have not received creative technique.

## Understanding Creativity

Based on Oxfod Advanced Learner dictionary creative means *having power to create of creation. Creative work regarding intelligence and imaginator.*

Conny Semiawan (1990) explained that means an ability to create new product. It does not have to be totally genuine, it could be a combination with some existed elements. Improving children creativity, including cognitive, affective, and psychomotry aspects.

It is also explained that cognitive improvement could be done by give stimulus to fluency, flexibility, and originality in thinking. Affective improvement done by regularly give stimulus for habit and passion in thinking creatively. The last is psychomotor done by providing educational instruments and

infrastructure to improve productive-innovative product (Semiawan,1990).

Teresa M. Amabile (1989), explained that there are two criteria of creativity. First, substantially different with others. Have not been seen or listened before. Second, creativity can also be seen from the ability to the repaired thing, make to be more beneficial.

Based on the previous explanations from experts, it can be concluded that creativity is an ability to create a creative idea, product, way to think differently and beneficially.

### The Nature of Creative Teaching Method

Torrance dan Myers, quoted by Treffinger (1980) Khatena Joe, (1982) explained that creative learning as:

...Becoming sensitive to or aware of problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; bringing together available information; defining the difficulty or identifying the missing elements, searching for solution, making hypotheses, and modifying and retesting them, perfecting them and finally communicating the results,

### Treffinger's Model to Improve Creative Learning

Treffinger's model to improve creative learning (Treffinger, 1980) is formed in three stages that begin with basic elements and go to more complex functions of creative thinking.

#### Level I: Divergent Function

This level is called divergent function to give point to openness and possibility. At the step of cognitive aspect, divergent function including fluency, flexibility, originality, elaboration in thinking. Though it is not part of divergent, in this step there are also intellectual aspects, such as cognition and memory.

In term of affective in level I, it includes Curiosity, Willingness to Respond, Openness, Risk Taking, Problem Sensitivity, Tolerance for Ambiguity, Self-Confidence.

Level I is the basis in which creative learning develops. Therefore, at the step, there are methods and techniques which are seen as the basic of creative learning.

#### Level II: Complex Thinking and Feeling

Level II, *Practice with the process*, or level II creativity techniques are the level in which students practice their ability that have been learned in level I. For this purpose; several strategies are used, for example, role-playing, simulation, and cases. Ability to think creatively asks students to do several functions: analysis, evaluation, imagination, and fantasy.

At level II, cognitive factors in level I are expanded and practiced. Cognitive factors in level ii including application, analysis, synthesis, evaluation, methodological and research skills, transformations of product and content, and thinking metaphorically and analogically.

Affective factors in level II include Awareness development, Open to complex feeling conflict, Relaxation, growth, Values Development, Psychological Safety in Creating Fantasy, and Imagery.

Based on a level I, it is prominent to notice that level II is one of the steps of the development and not the main goal.

#### Level III: Involvement in Real Challenges

Level III, *working with real problems*, is the level of implementation of creativity that has been learn in level I into real problems. In activity type III *Model Enrichment Triad* of Renzulli, students use their ability in a sound way in their life. They do not learn about creative thinking skill, but also how to use it in their life.

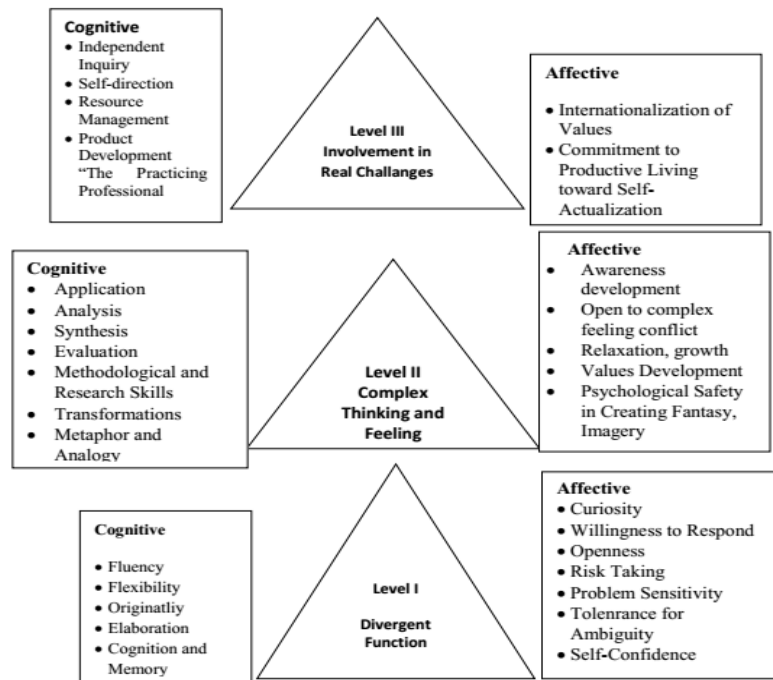


Figure 1. Treffinger Creative Learning Model (1980) Sources: A.S Munandar

The nature of level I and II are the basic effective and creative involvement of those in facing real problems. In term of introducing step, is the involvement in proposing questions independently and self-assessment. Students' creative learning lead to the identification of meaningful challenges and problems, proposing questions relate to , and the management of sources related to the improvement of result and product.

In the term of affective aspects, level III include internalisation of values and value system (Kratwohl dkk, 1964) the relation of proposing productive questions and an effort of self-actualization (Semiawan 1990).

### Creative Problem Solving

Creative Problem Solving is propose by Sydney Parnes, Ruth Noller, M.O. Edwards, and others. This technique is a systematic way to organize and manage explanation and idea to understand and solve the problem in a more imaginative way. This technique involves a logic-

analytic and divergent way of thinking. Divergent thinking is a way of thinking about various ways, search of possibilities and alternatives. Therefore, Creative Problem Solving is a structurized approach to creative thinking or an imaginative design of logical thinking.

Creative Problem Solving consist of five stages, those are *fact finding*, *problem finding*, *idea finding*, *solution finding*, and *acceptance finding*. All of the stages begin with *mess* and result to a *fuzzy problem*. All of problem solving stages has two phases, those are divergent and followed by convergent. In divergent phase of Creative Problem Solving, giving opinion technique is conducted, such as proposing ideas by postponing judges and consideration. Then in convergent phase (logic analytic aspect in answering questions), ideas and consideration are critically considered. Only relevant and related questions are chosen.

## Releted Previous Research

Traffinger, (2004) stated that the most effective way of creative problem-solving model. should involved children in thinking divergently (thinking creatively, while convergent is thinking critically) in using 5 steps : 1. *Fact Finding*, 2. *Problem Finding*, 3. *idea Finding*, 4. *Solution Finding* ( idea Evaluation), and 5. *acceptance finding* (idea implementation). Those steps are designed for grown up people, junior high school, and elementary students (Treffinger 2004).

The main distinction between the previous research with this research is the population of the research used in this research is non-gifted university students, problem solving in the research finding of creative thinking is producing creative product, in this case, is creative media.

The main reason for using this technique is because Treffinger's creative teahing is one of the strategies to solve the problem of creativity based on the problem of the research.

## Method

The research used quasi experimental method. The treatment used in this research was Creative Teaching Technique that was integrated within the Educational Psychology course. The research was conducted in the researcher's class with pre- and post-experiment design. The researcher actively involved in the research as the lecturer of the course. The main reason of the research is the problem of creativity is identified in the class and the interest of the researcher to solve the problem. The students are also those who are going to be elementary schools' teacher. Therefore, they need to implement creative technique in their class.

The design is as follow:

Measurement ( O1)  $\iff$  Manipulation (X)  $\iff$  Measurement ( O2)

This research is known as *before-after-design*. In this research there are two measurements conducted in class X, before and after the treatment, using the same test instrument. The test given are Creative Problem Solving test.

## Place and Time

The research was conducted in Department X, first semester students academic year 2015-2016 of Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta Indonesia. The time of the research is 2<sup>nd</sup> September -16<sup>th</sup> December 2015. The research was conducted every Wednesday at 13.10-15.30.

## Population and Sample

A sample of the research is 42 students of first-semester department X academic year 2015-2016 of Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta Indonesia. However, in this research the data taken only for 40 students.

Data collecting technique in this research is Creative Problem Solving test related with Educational Psychology course. The purpose of the research is to examine students' creative problem solving before and after the treatment. Pretest was conducted at 2<sup>nd</sup> September 2015 and the posttest at 16<sup>th</sup> December 2015.

**Data Analyzing Technique:** Data from pretest and posttest related with Creative Problem Solving ability is analyzed with following steps : *-analyze- Compare means -Paired-Samples T-test.*

**Free Variable:** Creative Teaching Technique is assumed as the variable that is affected other variable. Therefore, this variable happens first (antecedent) and followed by bound variable. In order to know its effect, then this variable will be manipulated in this experimental research. The term manipulation means the giving of different treatment to different subject.

**The Nature of Creative Teaching Technique:**

Creative Teaching Technique is to be more sensitive or realize with problems, weaknesses, gap of knowledge, unexist elements, disharmony, and other; to collect information, limit problems or identify unexist element; to look for answer, make hypothesis, test, and make it perfect; and finally to communicate results.

**Variable Y: Creative Problem Solving Ability:**

is a structurized approach of creative thinking or an imaginative logical thinking design. adalah suatuancangan (approach) yang berstruktur terhadap pemikiran kreatif, atau suatuancangan imajinatif terhadap pemikiran logis. There are five steps in Creative Problem Solving, those are: : 1. *Fact Finding*, 2. *Problem Finding* , 3. *idea Finding*, 4. *Solution Finding* ( idea Evaluation), and 5. *acceptance finding* (idea implementation).

Steps of the Research :

1. The researcher gave pretest of five steps creative problem solving test that has been integrated with educational psychology course at 16<sup>th</sup> September 2015.
2. The researcher gave level creative technique ( brainstorming, train open question, answering if-question, put related pictures, stories, make creative questions) during the teaching in the first semester.
3. At the fourth meeting, students were given level II creative teaching using sosiodrama.
4. At the eighth meeting, after mid term test, students were given level III creative teaching: creative problem-solving in material “Teach Special Need Students”. At this stage, students are given task with five steps problem solving: 1. Fact Finding, 2. Problem Finding , 3. idea Finding, 4. Solution Finding ( idea Evaluation), and 5. acceptance finding (idea implementation).

Students are expected to be able to find creative media to teach Special Needs Students.

5. The task are collected at 16<sup>th</sup> December 2015.
6. Researcher start to score Creative Problem Solving Process and the production of creative media.

**Scoring Criteria:** Scoring of Creative problem solving has 4 dimensions, those are: fluency, flexibility, originality, and elaboration. Those are based on the way to find suggestion:

Suggestion Proposed	Score	Scale	Alphabetic Score	Indicator
15-20	80-100	4.00	A	Very Fluent
11-15	70-79	3.00	B	Fluent
6-10	60-69	2.00	C	Unfluent
1-5 cara	50-59	1.00	D	Very Unfluent

**Experiment Result with Level I Technique**

**Question I**

*How do you feel today?*

*Can you explain your feeling today.*

**Open-Ended Questions’ Answers**

*How do you feel today?*

*Answer 1.*

*It is getting better than yesterday, and I am quite happy because several days ago I got my periods. If I am in my red day, I kinda feel of anger and furious .....*

*Answer 2*

*This morning the traffic jam is quite bad, I am quite confused because there is no traffic light. Finally, I found there is such kind of Islamic’s sermon.*

*Answer 3*

*I lost my mood in a study today, because I miss my home so much today, my family, father, mother, and everyone, I want to go to my lovely home.*

*I am in the gloomy and sad day, I could not focus to my lecturers, I just lose my spirit and daydream the whole lectures.*

Answer 4

*I am so happy, I am so sad, I am so excited because today everything mix and be one.*

Answer 5

*Start my day with a very heavy sleepy feeling, because stayed up all night, but still woke up with happy feeling because my parents woke me up to pray shubuh. Today's lesson start at ten, so I have time to help my mother cooks. I am so happy when helping her cook.*

Based on students' answer to the open-ended question 1, it can be concluded how they reflect their feeling. Answer 1. Happy and mad. No. 2. Unable to express the feelings. While, no.3 homesick and happy. There are several points: first, they are happy to express their feeling in the first day. However they still not used to it. Second, they start to be part of the class and start to express their feeling writtenly. Third, they start to enjoy to be in class. In some moments they laugh in joy.

### Question 2

**How to make class comfortable?**

Ho How to make class comfortable?

Answer 1.

*To make classroom comfortable, conducive, not monotone, not too hot, not noisy like in the market, and more friendly, communication among students, and cool teacher.*

Answer 2

*We have to manage elements and aspects to make learning not monotone.*

Answer 3

*To make class comfortable, keep the room clean. Not make the class too rigid, because it should be fun and harmony to make class comfortable.*

Answer 4

*Give a meaningful entertainment, a good communicative knowledge, not individual, and high empathy among students.*

Answer 5

*To make class comfortable, we should manage elements and aspects to make the class not too monotone. w to make class comfortable*

Based on the answer, it can be concluded students' answers are: 1. Not monotone shows creativity. 2. Manage fun and harmony. The last answer is to manage aspects and elements to make class not monotone.

### Statistical Analysis Using T-test for Creative Problem Solving

The following explanation will elaborate five steps of Creative Problem Solving, 1. Fact Finding, 2. Problem Finding, 3. idea Finding, 4. Solution Finding ( idea Evaluation), and 5. acceptance finding (idea implementation). Those steps are seen from aspect of fluency, flexibility, originality and elaboration. This task is given in the form of pretest and posttest as follow:

Table 2, Differences between Pre and Post Test

Paired Samples Statistics										
		Mean	N	Std. Deviation	Std. Error Mean					
Pair 1	X	335.82	40	31.498	4.980					
	Y	399.10	40	23.572	3.727					
Paired Samples Test										
		Paired Mean Difference	Std. Deviation	Std. Error	95% Confidence Interval of the Difference	Lower	Upper	T	Df	Significance (2-tailed)
Pair 1	X - Y	-63.28	32.643	5.161	-73.715	-52.83	-12.5	-12.5	3.00	.000

Based on the table 2. it is found that the difference of the mean between pretest, 335.82, and posttest, 399.10, is 63.275. With Significance 0.00.

### Testing of Hypothesis :

Ha. : Subject will have a significant score of Creative Problem Solving Ability when teaching with Creative Technique compare to those who do not.

H0: Subject will not have significant score of Creative Problem Solving Ability when teach with Creative Technique compare to those who do not.

There is differences of the mean between pretest and posttest after the Creative Teaching technique is implemented in the course. Therefore, the Ha is accepted, and Ho is rejected.

## Findings and Discussion

The result of the study found that the mean of pretest is 335.82 and for posttest is 399.10, data 63.2. Therefore it can be concluded that Creative Problem Solving before and after treatment has significance differences. This research proves that creative technique improves creative thinking for the students.

In the previous research creative technique commonly use for gifted children and improve their creative thinking, Treffinger, (2004) Khatena Joe, (1982). This research is conducted to university students in first semester and integrated withing the Educational Psychology course.

The result of the study shows that creative technique can be used to university students who are not categorized as gifted children. The improvement found after several treatments given. At the first week, students found difficulty to answer opend-ended

questions as given in level I. Based on their explanation; it is because they were not used to it. Researcher commonly waited for five minutes before they answer. Then the researcher encourages them to answer, because there will be no judging for their answer. The next week, the treatment was given. At the second month, they start to think creative fluently. At the third month, December 2015, their creative thinking is be more fluent.

This research rejected the idea that creative teaching could only be given to gifted children. This research in line with Terasa Amabile (1989), that stated every children is amazing. Everyone could become creative people and it still happens when they grow up. Creativity is not only for gifted and talented children, though their potential is bigger than normal children. Creativity could be part of all children and grown up (Teresa M. Amabile 1989).

Treffinger stated that it is important for the research to involve students in level III or creative problem solving, or what kind of teacher that can be success as facilitator in level III with his/her students. The research is rarely conducted in order to create creative product (Torrance, 1984) .

This research explain that level III creative technique can be integrated with courses. Task given use creative technique level I and for more challenging task use creative technique level III. First step is by teaching them Creative Problem solving and asking them how to practice it. For example in this research, students are asked to do research related with Special Need Students usE Creative Problem Solving.

Creative Product Research can be conducted as follow:1) Find fact; 2) Find problems; 3) Find ideas; 4) Find answer; 5) Find acceptance.

To have a creative product, students should find problems first that will be used to guide



them to make media. For example, at the second step they have found problems in Special Need Students.

Students should think creatively to help Special Need Students, for example, give offers by creating media. The result of the research has created various creative product for Special Need Students.

There are several limitations of the research: 1. the limitation of time, ability, and fund to conduct true experiment in order to know the exact result of the training. 2. No randomization, 3. The research is conducted solely without the help observer to check the trainer in conducting the experiment. 4. In t-test there is no normality test.

## Conclusions

This research answers the research question whether the creative technique can improve Creative Problem Solving for university students. Based on the research, it can be concluded that creative teaching method has a significant effect on students' Creative Problem Solving.

To know the student's ability to problem-solving creatively I assigned students to observe Children with Special Needs which is one of the subjects of Educational Psychology. At level 1, the ability to express student facts increases. They can average 10-15 facts.

At level 2, the ability to find problems. Students on average can find problems and can formulate problems. For example: In what ways can I improve my students' learning ability in special needs? In what ways can I help students with special needs? In what ways can I improve my students with special needs literacy skills? In what ways can I improve my students with special needs skills?

At level 3, the ability to find ideas. At this level the average student can find the average

idea of 30-40 creative and fresh ideas. For example by making Braille letter and sound, making videos, making games and Math, Hijaiyah letters arise and others

At level 4, the ability to find answers. At this level students are able to find answers creatively in the form of products. For example: media in reading for blind children, video, math learning media, and media hijaiyah letters.

At Level 5, the ability to accept answers. At this stage the student has received one answer based on the creative problem solving process. Finally, students collect 40 creative works in the form of products done individually.

Thus, creative teaching techniques can improve students' creative problem solving skills in regular classes. Creative teaching methods can be used by a teacher in various levels of education.

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