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# The Effect of OPPEMEI Model on Students' Creative Thinking Skill and Cognitive Learning Achievement

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**ABSTRACT**

The study was conducted to find out the effect of OPPEMEI model on creative thinking skill and cognitive learning achievement and their correlation in the third semester students of the Elementary School Education Department, Faculty of Education Science of Universitas Pendidikan Ganesha. This study was an experimental research with the Post-test-Only Control Group Design. The result of the descriptive statistical analysis showed that the students' creative thinking skill and cognitive learning achievement in the experiment class was higher than that of the control class. Furthermore, the result of inferential statistical analysis showed that there was a significant effect of the OPPEMEI model on the students' creative thinking skill and cognitive learning achievement with a positive correlation coefficient of 0.689 (medium correlation).

***Keywords:*** *OPPEMEI teaching model, creative thinking skill of the prospective elementary school teachers, science concepts, cognitive learning achievement*

## 1. INTRODUCTION

This template, Creative thinking skill is one of the key competencies in the 21st century. An individual's level of flexibility is very important in meeting the complex and fast changing opportunities and challenges in this global era. Creative thinking skill is one of the forms of creativity in teaching. Its mechanism can be shown by cognitive flexibility in the students [1]. Hence, studies on creativity are not only acknowledged in science and art [2][3][4] it is also proven to play an important role in solving daily problems [5][6][7][8][9]. Due to its crucial role in innovation, creation of new ideas and problems solution it has become the main focus of attention in most organizations and businesses [10], and some experts call it creative economics [11][12]. An important concept is that "innovation will become the most important factor in determining success in the future" [13]. Initiative to facilitate creativity is very important since a crisis in creativity has been identified, which shows a significant decrease in creativity since 1990s [14][15][16]. Creative thinking skill is attached to the normative function rather than to the inborn attitude. Hence, creative thinking can be trained [17].

The training process to develop creative thinking ability in science teaching still faces some constraints due to the varied backgrounds of the students of the Elementary School Teachers Education. Some have language major, some social science major and other science major. With the introduction of a generic curriculum the students who take science are very varied so that they have not reached a maximum learning in developing creative thinking ability. Thus, science teaching model needs to be taught to the students optimally so that the implementation of a new model to improve creative skill is interesting to be investigated [18]. Fazilla found that the students of Elementary School Teachers Education were given Science Students' Worksheets, if the meaning and benefit of science teaching was understood correctly, then the level at which it could be implemented and the level at which it could be evaluated were high, and the science teaching was effective [19]. The strengthening of the effect of teaching by OPPEMEI model is interesting to be conducted since the creative model

developed consists of some stages (1) orientation, (2) exploration of creative ideas (3) investigation, (4) elaboration, (5) presentation of results (6) evaluation as a reflection and revision, and the last one (7) implementation. This model is called OPPEMEI with 7 phases [12]

Based on the points above, this study was done to answer the following questions : a) does OPPEMEI model have some effect on creative thinking skill and science learning achievement of the students in basic science at Undiksha?; b) Is there any correlation between creative thinking skill and basic science after the students are taught with OPPEMEI model in the third semester at The Elementary School Education Department of the Faculty of the Education Science at Universitas Ganesha.

## 2. METHOD

This study was a quasi experimental research that investigated the effect of OPPMEI teaching model on the cognitive achievement in Elementary School Science and creative thinking skill. The study used post-test control group experimental design. The population in this study consisted of third semester students. The sample was selected by using the cluster random sampling technique. Based on the technique, Class A were selected as the experimental group and Class B as the control group, each consisting of 29 and 28 students respectively of the Elementary School Education Department of the Faculty of Education Science of Universitas Pendidikan Ganesha in the academic year 2017/2018. Class A (the experimental group) used OPPEMEI teaching model while Class B (the control group) used the conventional teaching model. The dependent variables in this study were science cognitive learning achievement and creative thinking skill. To collect the data, a cognitive learning achievement test of material change in an essay format and a creative thinking skill test in an essay format were used.

The cognitive learning achievement test covers all of the cognitive levels in Bloom's taxonomy: C1 (recall), C2 (understanding), C3 (application), C4 (analysis), C5 (evaluation), and C6 (creation) in the topic of material change. The creative thinking skill test covers four indicators of creative thinking: fluency, flexibility, originality, elaboration and evaluation [19] [20]. The data analyses used were statistical analyses: descriptive and inferential statistics. The descriptive analysis was used to describe attitude and cognitive learning achievement in basic science of the students while the inferential analyses consisted of normality test and homogeneity test using SPSS-2020. The normality was tested to know whether the data obtained from the respondents had a normal distribution or not by using Kolmogorov-Smirnov Test while the homogeneity testing was done by using a two-way ANOVA. To test the second hypothesis, Pearson correlation analysis was used while to test the significance t-test was used.

## 3. RESULT AND DISCUSSION

This study was conducted for eight meetings in the experiment class giving a treatment of an implementation of OPPEMEI teaching model in Class A, with the teaching syntax as follows: 1) orientation phase , that is to prepare the students psychologically and physically to follow the teaching process; the lecturer motivated the students to learn contextually according to the benefit and the application of the material in daily life, by giving some examples of the application of science in daily life; the lecturer gives problem/ questions that relate the prior knowledge of the students to the topic to be learned; the lecturer explained the learning objective of problem solving by telling the students the learning experience that will be experienced and directing the students to form groups, each with 4-6 heterogeneous members to do an investigation together, 2) creative idea development phase in which the students explore creative ideas to find claims as a form of freedom to make as many claims as possible by (1) making as many statements of problem as possible, (2) determining variables , (3) formulating hypotheses freely and openly according to their cognitive ability and, (4) designing experiments freely and creatively by using materials and tools for scientific purposes 3) Investigating phase in which the students test hypotheses concerning the problem that has been selected by exploring learning resources, then together with the group exploring various sources such as textbook and other references to support creative ideas in answering problems and collecting data through an investigation/ experiment or by doing creative tasks guided by students' worksheet. 4) Elaboration phase in which the students develop values of cooperation in themselves, both in communicating, expressing opinions and defending ideas/ opinions, appreciating other's opinions and communication ability, applying the ability to collect information through discussions about other problems in groups. 5) presentation of results in which the students prepare results of investigations/ experiments such as reports; the students display/ present the results in an open-discussion, other groups give comments or their opinions. 6) evaluation phase in which the students make an evaluation to verify creative thinking, and knowledge acquired during the teaching process; the students analyze, synthesize, make conclusions of the concepts of knowledge from the teaching process, and the students take the creative thinking test 7) implementation phase in which the students apply theories/concepts they got from the teaching process by stating new problems ( authentic problems related to the topic) [18].

In the conventional teaching model in Class B (control), after the treatment is over, the activity ends with a test of creative thinking skill to know the increase in the students' creative thinking skill after the teaching process is over.

Before testing the hypotheses, a prerequisite test was conducted which consisted of normality test and variance homogeneity test. The result of the prerequisite test showed that the data had a normal distribution, homogeneous, linear, collinear, and there was no interaction between covariate variables and dependent variables.

From the study that has been conducted data on the posttest of the students' creative thinking skill and cognitive learning achievement were obtained. Based on the scores of the posttest improvement in cognitive learning achievement of the students was determined through statistical analysis computation. It turned out that there was an improvement in learning achievement and creative thinking skill. The normality test of the control and experimental groups showed the result of normality. The level of significance was 0.987 > 0.05 for the control class which showed that the data were normal and the normality test of the experimental group showed the level of significance of 0.783 > 0.05 which showed that the data were normal too so that it was feasible to continue to the next testing. The first hypothesis that states that there is a difference in the students' cognitive learning achievement of the students who learned through OPPEMEI model and those who learned through the conventional model was accepted. The level of significance was 0.00 < 0.05. Thus, there was a significant difference in the students' creative thinking skill between the experiment class and the control class. In other words, the use of OPPEMEI can improve the students' creative thinking skill in learning Science as shown by Pearson correlation of 0.689. After being given a treatment in the form of a different teaching model there was a difference in the students' cognitive learning achievement. The mean score in creative thinking skill from the posttest result of the control class who were taught with the conventional teaching model was 71.43 while that of those in the experiment class who were taught with OPPEMEI teaching model was 91.21. These data show that there was a significant difference in the students' cognitive learning achievement.

**Table 1.** Correlation between creative thinking skill and learning achievment

| | | Creative Thinking Skill | Learning Achievement |
|---|---|---|---|
| Creative Thinking Skill | Pearson Correlation | 1 | .689** |
| | Sig. (2-tailed) | | .000 |
| | N | 57 | 57 |
| Learning Achievement | Pearson Correlation | .689** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 57 | 57 |

**. Correlation is significant at the 0.01 level (2-tailed).

Then the inferential statistical analysis showed that there was a significant effect of OPPEMEI model on creative thinking skill of the students and they had a positive correlation of .689 (medium correlation). The achievements of the control class and the experiment class for the creative thinking indicators were as follows. For the control class: fluency= 1.40, flexibility = 0.89; originality =0.71, elaboration= 1.80 and evaluation = 1.25, while for the experiment class: fluency= 238, flexibility= 1.97, originality=1.17, elaboration =1.91 and evaluation = 2.07.

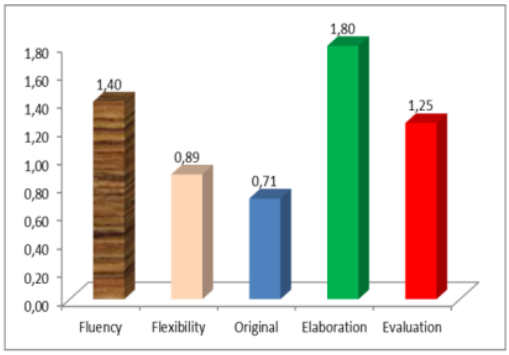


**Figure 1** Indicators of creative thinking skill for the control class

The experiment class could show an improvement in creative thinking skill of the students/OPPEMEI model consisted of seven phases: (1) orientation, (2) exploring creative ideas, (3) investigation, (4) elaboration, (5) presentation of results, (6) evaluation, and (7) implementation. The use of this model stems from cognition motivation theory that believes that individuals are motivated to perform an action from their minds when given a stimulus with various problems which are contextual so that a deeper understanding will be developed in addition, the construction of creative thinking skill can be developed better.

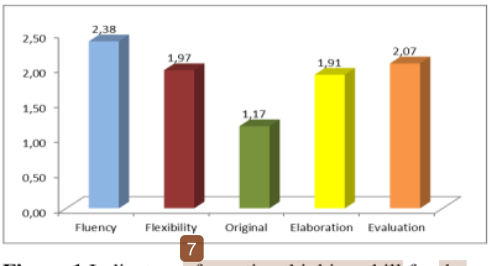


**Figure 1** Indicators of creative thinking skill for the experiment class

In the orientation phase, the students were required to have fluent thinking ability (fluency) that was focused and could improve curiosity and enjoyment in solving scientific problems. Fluent thinking could be initiated in two problems: that is, the cue of fluency was used to monitor the start: fluency in answering, or speed that produced an initial answer, intuitive, and perceptual fluency, or ease of problems that could be read [21]. The advantage of the orientation phase compared to its trivial model is in the aspect of giving simpler examples, to simplify problems.

The second phase, the exploration of creative ideas. The students in this phase explored creative ideas in solving problems by making problem statements, formulating hypotheses, determining variables, defining variables, and designing the experiment procedure. The students can learn optimally if the lecturer gives an intrinsic motivation appropriately [22]. The students are given ambivalent/ ill structured problems which can increase curiosity [23]. In this phase the students can develop integrated and comprehensive understanding.

The third phase was investigation. The lecturer accompanied the students to investigate according to the design that had been determined. Accompanying the students to classify data and facts obtained well. The students could determine the best way to solve scientific problems in a small group. The students had an open mind to various situations and were able to make a mental picture or the problem faced.

The fourth phase was elaboration, developing and enlarging a new idea (originality), making into detail the solution to the problem and scientific argumentation contained in the report of the investigation. The empirical support provides a learning environment that matches the students' needs [24] the elaboration phase could be modified to improve cooperation and provide more time to a heterogeneous group. The aspect of problem solving was given more details so that it could increase high order thinking of the students. The fifth phase was presenting results. The students could think fluently to produce many ideas/ answers relevant to the scientific problems given and had the ability to think flexibly to defend and accept opinions. They could express ideas/ descriptions of experiences resulted from an investigation in detail. This phase needs supports and strongly controlled time management. The students can fluently present the results of their investigation.

The sixth phase was evaluation. In this phase the students evaluated the situation related to the problem solving. They could evaluate the results of teaching in terms of process and product. This needs a rubric of evaluation. It can become an inspiration for those with high and low IQ.

The seventh phase was implementation. The students could implement originally theories/ concepts to produce a reflection (evaluation) and a final evaluation of the creative thinking skill to obtain a significant knowledge. This needs a teacher that is able to implement new ideas in daily life, optimizing the mastery of concepts and creative thinking ability to make the students enjoy and love the learning process.

Viewed from creative thinking skill, it can be concluded that there was an increase. This condition could occur because of the implementation of OPPEMEI model with systematic phases to stimulate students' activities starting from orientation. In the orientation phase the students used their ability to listen and observe and then entered the phase of thinking to explore creative ideas until the final phase of implementation. This is in line with the Confucius' saying "I hear and I forget. I see and I remember. I do and I understand." 25].

Creative thinking skill improves when OPPEMEI model is implemented. This is closely related to the psychological factor known as "self concept". Self-concept is not an inborn factor, but a factor that is learned and developed through individual experiences in relationships with other people. Thus, an individual's view about himself or herself is influenced by how he or she interprets others' views about himself or herself. Thus, it becomes a natural condition that every human has a different ability. This can occur since human has the ability to reflect about himself or herself which is called "self-concept" [26]. Rahman's study showed that self-concept influences students' creative thinking ability. Self concept is closely related to the number of responses. The higher their self-concepts show the more their activities [27].

Flexibility of the students also increases when OPPEMEI model is implemented. This can be explained that the model actually uses scientific approach. This approach can be viewed in the investigation phase. Scientific approach is effective in improving flexibility in the teaching of basic science concepts [28].

This increase is supported by habitus theory in which the result of the internalization of social world structure or internalized social structure. Habitus is the product of history that develops after a human is born and interacts with the society in certain spaces and

times. Creative thinking skill can be increased through the support of OPPEMEI model, since the orientation phase gives a full picture of an object. The orientation phase plays an important role that needs to be used to increase performance [29].

The use of OPPEMEI model, especially after the orientation phase, which is continued with the exploration of creative ideas, can produce creative thinking skill, since these phases stimulate motivation. Motivation built in the first phase will provide the power to explore to individual's ability [29]. Motivation in a group strengthens the occurrence of individual's scaffolding and group play that is built in the group motivates creative thinking, and working in group in OPPEMEI model produces competitions that make creative thinking skill, especially in the original indicator, continue to develop [30].

## 4. CONCLUSION

Based on the study done it can be concluded that the result of inferential statistical analysis shows that there is a significant effect of OPPEMEI model on the creative thinking skill and the cognitive learning achievement of the students and they correlate positively at 0.689 (medium correlation).

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