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Preliminary Analysis of the Student's Creative Thinking Skills in the Elementary School Teachers Education Study Program

Ika Lestari[1*], Linda Zakiah[2]

Elementary Teacher School Education Program State University of Jakarta

[1*] ikalestari@unj.ac.id, [2] lindazakiah@gmail.com

Abstract: Creativity is needed by elementary school teachers in designing learning that fosters thinking and creative attitude in students. Before being able to create an instructional strategy that encourages creative thinking and attitudes, should before becoming a teacher, students of elementary school teacher educational study program candidates need to be assessed for their creative thinking abilities because the learning patterns possessed by students show a mechanistic system, meaning learning is done if there is an assignment by the lecturer. This study aims to determine the ability of university students to think creatively to find patterns of instructional models that can foster creativity in students as potential elementary school teachers. This research was conducted in the Elementary School Teacher Education study program, Universitas Negeri Jakarta along 2019. Taking samples with purposeful sampling method namely 58 students. The research method used is qualitative with data collection instruments in the form of creativity tests. The results of the study showed that the low creative thinking ability possessed by students is caused by instructional and learning patterns both given by the lecturer and within students. The recommendations of this study present an instructional model that can foster or encourage creativity in students.

Keywords: *creativity, creativity test, instructional, characteristics of creativity*

INTRODUCTION

Creativity is an important aspect of human development, which is no exception in educational institutions such as schools (Chan & Yuen, 2014). Educational institutions are the right place to develop creative talents and the ability of students to think creatively. The real challenge that exists in educational institutions related to creativity is the level of teacher knowledge about how to teach creatively, learning strategies that can be used to develop students' creativity, as well as the concept of creativity itself. Creativity is considered an important 21st-century skill (Donovan, Green, & Mason, 2014; Rotherham & Willingham, 2010).

Creativity is a collection of abilities and characteristics that cause creative thinking. Creativity related to genetic and innate factors cannot be denied if parents, teachers, and the educational environment provide resources that can facilitate creativity for students (Ravari & Salari, 2015). The standard of creativity resolution is the ability of individuals to use thinking in generating new and competitive ideas. Originality considers new things or uniqueness while compatibility is called usability, suitability, relevance, or meaningfulness (Mark A Runco & Jaeger, 2012). Creativity can be in the form of real or abstract ideas or can be accepted with logic. However, creative thinking wants to discuss existing experiences and knowledge. Through experience and knowledge, someone will try to find ideas in perspective and dimensions to create new ideas or products that are better than before in making decisions and solving problems (Daud, Omar, Turiman, & Osman, 2012).

Cognitive factors that are combined with personality, motivation, and environment affect a person's creative achievements (Cho, Chung, Choi, Suh, & Seo, 2011). In addition to these

factors, teacher characteristics also have an important part in generating creativity (Hong, Hartzell, & Greene, 2009; Bramwell, Reilly, Lilly, Kronish, & Chennabathni, 2011). Characteristics of teachers who are seen to have different sides, Hong et al. (2009) found that in the school environment, teacher characteristics such as clear goal orientation for learning were associated with creativity that encouraged learning practices. Personal characteristics of teachers can also play an important role in their approach to fostering creativity in others. Bramwell, Reilly, Lilly, Kronish, & Chennabathni (2011) suggest that teacher intelligence (intrapersonal and interpersonal), motivation, and values are important factors in their commitment to creativity. Learning outcomes are thus seen as a result of the teacher's characteristics, their pedagogical skills, and the environment in which they operate.

Students of the Elementary School Teacher Education study program are prospective elementary school teachers who are required to be able to design learning activities that develop aspects of creativity in their students later. Before being able to design creative learning activities, it is necessary to know the initial analysis of their creative skills. The preliminary study conducted on 100 students in January 2018 found a majority (70%) of university students answer lecture assignments given by the lecturers are only paper-based, so students only take from internet sources without prior analysis (copy-paste from the Internet). Students seem to be less than optimal because in their daily routines in a lecture only sit, listen, and note. Analysis, evaluation, and creative activities are rarely trained in students. The types of exercise questions given only involve memorizing or memorizing formulas, so that when students are given practice questions that require more complex completion tend to feel difficult with the given practice questions (Yuliati & Lestari, 2018).

The National Advisory Committee on Creative and Cultural Education distinguishes the meaning of "teaching creatively" from "teaching for creativity" (Cayirdag, 2017). Creative teaching is more about using an imaginative approach to make learning more interesting and effective while teaching for creativity refers to efforts to develop students' creative thinking. This difference in understanding has implications for the relationship between the two teachings for creativity requires creative teaching, while to be able to teach creatively, teachers must utilize their creative potential. Consequently, the teacher's personal abilities are required to teach for creativity (Cayirdag, 2017). Torrance (1972) has the opinion that creative teachers certainly have a variety of options for dealing with problems in the classroom and creative teachers can inspire students' creativity to be role models (Torrance & Myer, 1970). Sanches (1994) links how the teacher's creative style is connected with his pedagogical practice. Teacher creativity is important because it affects students (Halliwell, 1993) especially with elementary school students who have low level of creativity (Subali, Paidi, & Mariyam, 2017; Subali & Mariyam, 2015). This can be caused by learning targets that focus on understanding concepts so creativity is not the main learning target. In fact, according to Burke-Adams (2007), it is very important to consider the learning needs of students in integrating creativity into standards-based systems.

But in practice, teacher creativity is under pressure from national exams (Aktas, 2016; Aljughaiman & Mowrer-Reynolds, 2005; Amabile, 1996; Craft, 2001; Gordon, 1999; Hayes, 2004) and supporting creativity is seen as a paradox in a performance-based systems (Grainger, Barnes, & Scoffham, 2004; Hartley, 2003; Prentice, 2000). Dobbins (2009) found that teacher creativity is limited by curriculum and learning objectives. Jeffrey (2002) and Tomlinson, Little, Tomlinson, & Bower (2000) criticize this approach because it places too much emphasis on measurable improvements that emphasize the assessment results that are too many constraints and structures that lead to the suppression of creativity and innovation. With the teacher in a

teaching condition that limits creativity, he must rely more on the teacher's personal creative power. This point is important because teaching is an improvised activity (Rejskind, 2000; Sawyer, 2011) and there is room for creativity (Baer, 2003; Baer & Garrett, 2010; Beghetto & Kaufman, 2010).

Previous research that has been done for elementary school students is to examine the involvement of parents in the creativity of elementary school-age children (Suparmi, Suardiman, & Kumara, 2018) as well as the level of creativity of elementary school students (Subali & Mariyam, 2015; Subali et al., 2017), in primary and secondary education (Pfeiffer & Wechsler, 2013; Newton & Newton, 2010; Mujib, Darhim, & Kartasasmita 2016; Chiedozie, O., & Okoye, 2017; Lestari, Bharati, & Rukmini, 2018) but also in higher education (Gibson, 2010; Hosseini, 2011). That research shows that growing creativity in basic to high education is very important. If higher education aims to help students develop their potential to the fullest, making students creative is an explicit part of their higher education (Alencar & Fleith, 2017).

This study aims to measure the ability of creativity possessed by students as prospective elementary school teachers so that later instructional models can be produced that can foster student creativity. The main question to be answered in this study is, "How far is the level of creativity possessed by prospective students of elementary school teachers at Universitas Negeri Jakarta?"

LITERATURE REVIEW

Definition of the concept of creativity

The term creativity can be used in three ways, namely referring to a series of processes (for example, thinking "creative"), a group of personal characteristics of people (for example, "creative" personalities), and for results (for example, "creative" products) (Cropley, 2011), this understanding also existed from 1980 (Gilchrist, 1980). Thus, creativity is considered as a cause (for example, the creative process produces a product; someone's creativity causes them to behave in a certain way) and also as a result (certain types of products that result from people and processes). Creativity has three elements for early namely the "classic" 3P approach (people, processes, products) which is then expanded by incorporating another P element (the fourth element), namely "press" (environmental pressure that can facilitate or inhibit creativity (Cropley, 2011).

The standard of understanding creativity includes originality and effectiveness. According to the standards of creativity, originality and effectiveness are two criteria that distinguish creative activities and creative products (Corazza, 2016). Creativity can also be interpreted as something new and useful (Mumford, 2003). Thus, creativity is defined as a new and useful approach that has 4 P elements (person, process, product, press) (Gilchrist, 1980; Cropley, 2011; Batey, 2012).

Dimension of creativity

Figure 1 explains the process model and the ability to think of creativity. Having creative thinking alone does not guarantee the birth of creative products because someone is complex including systems of cognitive skills, abilities, personality factors, and motivations as well as style, strategies, metacognitive skills that work together to produce creative behavior. The behaviors are such as finding, identifying, and clarifying problems is creative thinking rather than convergent thinking (Kong, 2007).
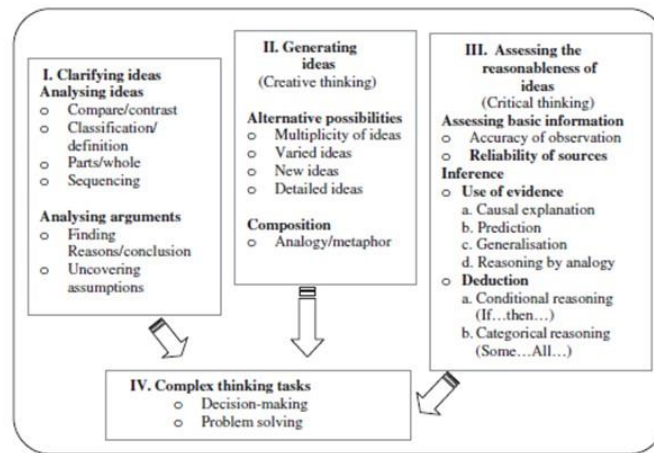
Figure 1. The process model and thinking skills (Kong, 2007)

Measurement of creativity includes not only cognitive processes of creativity, but also motivation, interests, attitudes, and styles associated with individuals. Environmental aspects are also considered as a measure of creativity. One of the earliest instruments to measure creativity is the Torrance Test of Creative Thinking (TTCT) which is based on four factors, namely fluency, flexibility, originality, and elaboration that are used to measure participants' creativity (Sriraman, 2011). TTCT is considered good for measuring creativity because it not only identifies but can also find and encourage creativity in everyday life for the general public. When used appropriately, TTCT can increase creativity among students (Kim, 2006). This study prefers to use the Intellectual Structure Test from Guilford, which aims to measure the operating dimensions of divergent thinking with the dimensions of verbal content to facilitate measurement of creativity because the tests made are standardized. Based on the concept of Guilford (in Sriraman, 2011), creativity is seen from aspects of fluency, flexibility, authenticity, and elaboration.

The Framework of creative pedagogy

The creative pedagogy framework illustrates the relationship between creativity and pedagogical practice through three interrelated elements - creative teaching, teaching for creativity, and creative learning. Figure 2 explains the processes that often occur in conventional learning methods, while figure 3 illustrates three elements of creative pedagogy (Lin, 2011). The teacher delivers knowledge; students learn only by listening and accepting what is taught.
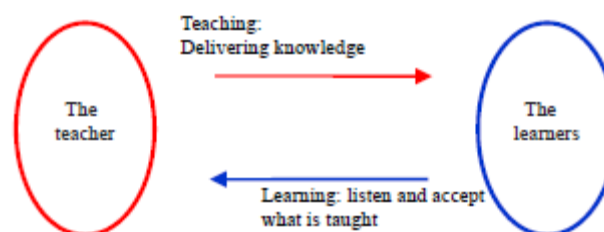

Figure 2. Conventional teaching and learning process (Lin, 2011)

The climate that supports creative activities is created through interactions between inventive and effective teaching (by creative teachers and creative learning by creative students). Conventional teaching is usually students tend to learn individually, more passive in receiving information from the teacher, or just working on student activity sheets (Listiana, Susilo, Suwono, & Suarsini, 2016). For this reason, it is expected that learning involves elements of the creative, so that figure 3 explains three elements that need to be present in creative pedagogy.
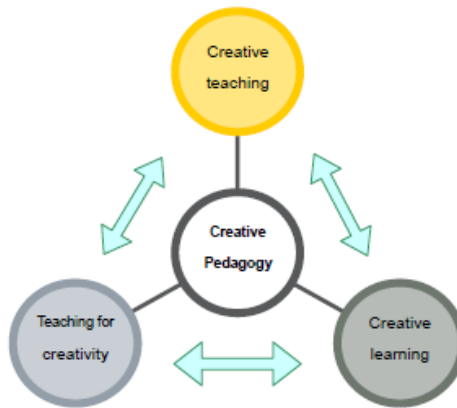

Figure 3. The three elements of creative pedagogy (Lin, 2011)

Creative teaching and creative teaching have a different focus. Creative teaching focuses on teacher practice while teaching to be creative looks at the student's side (Craft, 2005).

RESEARCH METHODS

Methods

This study uses a qualitative approach with descriptive methods so that data analysis techniques with descriptive statistics. The creativity score obtained based on the creativity assessment rubric that has been determined, which then results are seen based on the category of creativity.

Participants

The number of students who tested their creativity was 58 students using the intellectual structure model of Guilford. Sampling technique with purposeful sampling. 58 of these students are students from classes taught by researchers to make it easy to determine the right instructional model in developing student creativity for the next stage of research. The place of research is conducted in the study program of Elementary School Teacher Education in Universitas Negeri Jakarta in 2019.

The instrument for data collection

The instrument for collecting data to measure creativity uses a creativity test in the form of a description issued by Guilford so that the tests are standardized namely fluency, flexibility, originality, and elaboration.

Data analysis technique

To analyze categories and aspects of creative thinking skills used descriptive statistical analysis. Measurement of thinking creativity is done by asking the test takers to make as many

answers as possible on the items in the specified time. To be converted into scores, answers are interpreted in fluency, flexibility, originality, and elaboration. The creativity thinking score is the combined score of the four elements.

Fluency is related to the ability to produce many alternative ideas for solving problems in a short time, but the answers match the problem. Flexibility is the ability to easily change the problem-solving approach used if new problems or conditions require a new approach. Originality makes a person capable of proposing unusual or unique proposals and can do new or special problem-solving. Elaboration is the ability to give answers in detail while being able to enrich and develop these answers. Table 1 explains the assessment of creativity used in this study to quote from Zubaidah, Fuad, Mahanal, & Suarsini (2017) dan (Treffinger, Young, Selby, & Shepardson, 2002).

Tabel 1. Creativity assessment

Indicator	Criteria	Score
Fluency	Mentioning/writing five or more ideas, suggestions or different alternative answers	4
	Mentioning/writing three ideas, suggestions or different alternative answers	3
	Mentioning/writing some ideas, suggestions or alternative answers that are not very different	2
	Mentioning/writing one idea, suggestion, or alternative answer	1
	Not answering or giving a wrong answer	0
Originality	Mentioning/writing several interesting, unique ideas that are logical, relatively new and relevant to the given problem	4
	Mentioning/writing several interesting, unique ideas that are logical, relatively new, but not quite relevant to the given problem	3
	Mentioning/writing quite interesting unique ideas that are quite logical, relatively new and quite relevant to the given problem	2
	Mentioning/writing an ordinary idea that is logical and relevant to the given problem	1
	Not answering or giving a wrong answer	0
Elaboration	Explaining several logical details of an existing idea, so that the formulation of the idea becomes clearer and can be applied more easily	4
	Explaining one logical detail of an existing idea, so that the formulation of the idea becomes clearer and can be applied more easily	3
	Giving several logical details of an existing idea, but not quite relevant to the concept of the main idea, so that not making the idea becomes clearer	2
	Not adding any details of an existing idea, so that the formulation of the idea cannot be applied well	1
	Not answering or giving a wrong answer	0
Flexibility	Writing several alternative answers that are very logical and relevant to the given problem from different points of view	4
	Writing a few alternative answers that are quite logical and relevant to the given problem from different points of view	3
	Writing several alternative answers that are quite logical but less relevant to the given problem from different points of view	2
	Writing one alternative answer that is quite logical and relevant to the given problem with only one point of view	1
	Not answering or giving a wrong answer	0

Table 1 is used as a creativity assessment rubric when students carry out eight test questions. After obtaining a score of creativity, then it becomes a score and categorized into table 2.

Tabel 2. Creativity assessment categorization

Level	Characteristic
Level 4 (very creative) 81% - 100%	Students can show all aspects of creativity, namely fluency, flexibility, originality, and elaboration in solving problems.
Level 3 (creative) 61% – 80%	Students can show three aspects of creativity, namely fluency, flexibility, originality, and elaboration, in solving problems.
Level 2 (moderate) 41% – 60%	Students can show two aspects of creativity, namely fluency, flexibility, originality, and elaboration, in solving problems.
Level 1 (low) 21% – 40%	Students can show one aspect of creativity, namely fluency, flexibility, originality, and elaboration in solving problems.
Level 0 (very low) 0% – 20%	Students are not able to show aspects of creativity, namely fluency, flexibility, originality, and elaboration in solving problems.

The methodology carried out in this study is only qualitative with descriptive statistics so that there are no known factors that cause lack of high creativity of students.

RESULTS AND DISCUSSION

Students assessed the aspects of creativity based on the four aspects, namely fluency, flexibility, originality, and elaboration, by answering the eight description questions. The results of the creativity test entries are then seen by using the creativity assessment in the next table categorized in table 2. Table 3 describes the number of students as many as 58 people given eight creativity test questions.

Table 3. Student creativity test results

Question number	Creative Thinking Aspects				Average Score for Four Indicators
	Fluency	Flexibility	Originality	Elaboration	
1	40%	37%	31%	26%	33.5%
2	32%	29%	22%	30%	28.25%
3	40%	38%	29.3%	30%	34.33%
4	26%	22%	19%	27%	23.5%
5	17.2%	16.8%	17.2%	16%	16.8%
6	39.7%	38%	29%	28%	33.68%
7	40%	39.2%	25.9%	31.5%	34.15%
8	38.4%	37.1%	27.6%	25%	32.03%
Number of students =	58 students				
Average score for each aspect of creativity	34.16%	32.14%	25.13%	26.69%	

Table 3 shows that all aspects of creativity are in a low category (21% - 40%). The reason that makes this happen is that students are only focused on getting one correct answer to a problem (convergent) and not yet accustomed to thinking differently. Research that has been conducted examines the views of university students towards learning the creative process from five different disciplines namely Arts, Education, Engineering, Humanities, and Social Sciences

(Daly, Mosyjowski, Oprea, Huang-saad, & Seifert, 2016). Students in educational disciplines show lower development of creative processes because they focus on systems that provide learning material to school students in innovative ways. As a result, the emphasis of learning is more on evaluating the impact of creative application on learning and less on creating new learning methods. Students in educational disciplines report less study with group work and practice in the classroom than other disciplines as well as more homework and examinations. The application of the creative process is more common in the Arts, Humanities, and Social Sciences classes. Learning patterns that are carried out center on technical information, exercises in class, homework, and group learning. Students want an emphasis on feedback given by teachers, opportunities to give and receive criticism from fellow students, and time to work in groups. In general, lectures take 3 or 4 hours (or less) per week, however, in art schools, study hours last for six hours per week or even more. This is what makes art school students more creative than students from other disciplines. To that end, adding more hours of study each week, adding work in the classroom with other students, emphasizing brainstorming creative ideas, choosing project topics and working on open projects can encourage the development of creative skills (Daly, Mosyjowski, Oprea, Huang-saad, & Seifert, 2016).

The results of creative thinking from students in several studies show that low has started at the elementary school level (Subali, Paidi, & Mariyam, 2017; Subali & Mariyam, 2015), a study conducted by Zubaidah et al., (2017) that measures the creativity of junior high school students in Kediri, Indonesia, which falls into the low category. Creativity scores are obtained (1) flexibility (18.75), (2) originality (12.05), (3) elaboration (16.28), and (4) fluency (15.90). This result proves that at the school level, students' creative thinking skills are already low so that the learning treatment carried out by teachers has not been able to design learning activities that can foster creativity in students so that at the university level, there is no significant difference in scores on aspects of creativity. Only experiencing an increase from a very low level (0% - 20%) became a low level (21% - 40%) during junior high school to college.

The highest aspect of creativity compared to the other three aspects is fluency (34.16%). The fluency of creativity is due to the smoothness of wanting students to pour out ideas at the beginning without much screening. Students often speculate in giving answers when the test is to answer the description with a lot of answers so that there is a possibility that the answer given approaches the correct answer according to the question. Another factor that can trigger the highest aspects of fluency is the time pressure given when answering creativity tests. Students who do assignments in time stress show a positive mood because it is felt like a challenge that will activate a positive mood so that in the end, the fluency component in creativity will increase in line with the Cognitive Activation Theory of Stress (Shalsabila et al., 2018).

CONCLUSION

Based on the results of the study on the scores of creativity possessed by students in the low category (21% - 40%), which is caused by the learning model that has been on the lecture bench. The need for changes to learning models in the classroom is important through adding more learning hours each week, adding work in class with other students, emphasizing brainstorming creative ideas, choosing project topics and working on open projects can encourage development creative skills. A creative pedagogy framework model that involves lecturers and students is needed in designing learning activities that foster creativity in students. The next study can propose a creativity pedagogy model for students tailored to the learning characteristics and pedagogical values possessed by students. The limitations of this study only

focus on the profile of the ability of the initial creativity possessed by students to further determine the treatment that can be given in increasing creativity in students.

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