

**MIND MAP IMPLEMENTATION IN INTEGRATED NATURAL
SCIENCE EDUCATION TO IMPROVE PGSD STUDENTS' CREATIVITY**

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Article Info	Abstract
<p>History: Submitted January 22th, 2020</p> <p>Revised January 23th, 2020</p> <p>Accepted February 11th, 2020</p>	<p>This study aims to determine the implementation of mind maps in Integrated Natural Science education learning in improving the Elementary School Teacher Education students' creativity, Faculty of Teacher Training and Education, UST Yogyakarta. The type of this research is a classroom action research with a model design from Kemmis and Mc Taggart. The subjects in this research were 3G class students of Integrated Natural Science of Elementary Schools course with 44 students, while the object of this research was the mind map method and students' creativity. This research was conducted in two cycles with each cycle consisting of planning, acting, observing and reflecting. Data collection techniques are using observation, questionnaires, and documentation. The data analysis technique used is descriptive analysis with the percentage criteria of creativity improvements. The results showed that the mind map method could improve the Elementary School Teacher Education students' creativity, Faculty of Teacher Training and Education, UST Yogyakarta. The creativity improvement can be seen from the average percentage in cycle 1 of 68.53% and in cycle 2 of 87.64%. This shows that the mind maps method can improve Elementary School Teacher Education students' creativity, Faculty of Teacher Training and Education, UST Yogyakarta.</p> <p>Keywords: Mind Map; Science; Creativity; Students</p>

A. Introduction

Elementary School Teacher and the learning objectives will be Education Study Program (PGSD) easily achieved. Faculty of Teacher Training and Education, UST Yogyakarta, is a study program that prepares excellent and qualified elementary school educators based on the Tamansiswa teachings. In order to realize this, the education process held in Elementary School Teacher Education must be conducted well, because the successes of the education that conducted will determine the teachers' quality printed and will also affect the quality of education at the Elementary School level later.

The teacher is the key holder of the learning process successes. Whether or not a learning goal is reached, depends on the activities conducted by the teacher in learning. One important aspect that must be owned by the teacher so the learning process can run well is creativity. The creative teacher will create a creative learning process. The learning that will be done later will be more interesting, have quality and make the students happy in doing the learning process. By doing so, the material delivered can be well absorbed

Someone can be said to be creative if he/she has the ability to create or combine the existing works into something new and different. This creative skill can be used to encounter problems, be able to think critically, have lots of ideas and be able to find alternative solutions by divergent thinking (Ali and Asrori, 2012; Ghofur and Risnawita, 2010; Uno and Muhammad, 2011).

Creativity is very much needed in facing the development of the era, especially the 21st century (Shum & Crick, 2016: 9). This attitude can be used as a provision to facing a fast-changing world (Tsai: 2012).

Creativity is not just embedded in the teacher just like that but required habituating effort to fostering creativity. The learning process in Elementary School Teacher Education is one of the media that can be used to improve the creative soul of prospective teachers. Prospective teachers must be truly educated to be excellent educators, who are able to conduct an active, creative and innovative learning process so the

quality of the human resources are formed.

The observation results indicate that the creativity owned by elementary teacher candidates, especially third-semester students of class G in Integrated Natural Science of Elementary Schools course is still very minimal. This is proved by the lack of ideas or thought owned by students and the homogeneity of the work produced by students. When given the opportunity to show their creativity, students are still not confident even confused with what must be delivered.

When the lecturer asks and provokes students to express their opinions, the student just silent and no one dared raise their hands to express their opinions. When given the assignment, the results collected are the same between the results of one student with other students. This proves that the students' creativity needs to be developed. If this ignored, it will have an impact on the learning process that will be carried out later if they teach in elementary school.

An alternative that can be used to foster the Elementary School Teacher Education students' creativity as stated
JPSD Vol. 6 No. 1, Maret 2020
ISSN 2540-9093
E-ISSN 2503-0558

above is to implement the mind map method in the learning process. Mind maps are a compilation of notes using short words, attractive colors, lines, symbols and images to help students use their full potential of the brain optimally (Ananda, 2019; Safitri, 2016; Windura (2016; Sani, 2015; Shoimin (2014) explained that mind mapping can be used as whole-brain utilization technique by using visual images and other graphic infrastructure to form impressions. The impression referred here is the method used to form the readers' attractiveness so what has been seen can be easily remembered in the brain and mind.

Buzan (2010) explained that mind map is useful as a broad subject summary, facilitate to make planning, helps knowing the purpose and position of objects, collecting big data in one frame, and provide encouragement as an effort to solve problems. Mind maps also help students in remembering material, so students' visual intelligence, creativity, and critical thinking improved. (Olivia, 2008).

Mind map implementation is expected to be able to improve the prospective teachers' creativity
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(Elementary School Teacher Education students). With this creativity, students will be helped in conducting the learning process later in elementary school. With a creative teacher, learning will be held well and the learning objectives that wants to be achieved can be achieved properly. The learning outcomes obtained by students are also good because it used interesting methods and adjusted to students' characteristics.

Various researches conducted by Anggraini (2016), Fauziah (2017) and Ananda (2019) mentioned that mind maps are very suitable to be implemented in elementary schools. However, if the teachers itself does not understand and does not have the ability to create mind maps, then students will have more difficulty in applying it. So the first thing to do is to equip the students of prospective elementary school teacher about creativity in making mind maps so later when they teach, they can implement it well.

Natural Sciences is a science that is used as a tool to obtain the truth about facts and natural phenomena with empirical activities as a medium to build curiosity, knowledge, and the ability to

JPSD Vol. 6 No. 1, Maret 2020
ISSN 2540-9093
E-ISSN 2503-0558

work scientifically (Hendracipta, 2016; Andriana, 2015). The course of Integrated Natural Science of Elementary Schools are the subjects that require students' creativity because in this course learn how to integrate science material in the thematic learning process, especially in the curriculum 2013. The complexity in integrating these various materials can be anticipated by using mind maps. The mind map is able to bridge between material that seems to be separated and then connected become one unity in theme and mutually integrated. Mind maps can also be used as a tool to collect literacy information that obtained from various sources, so the obtained information can be well summarized. Literacy Information is a skill in processing information obtained from reading and writing (Nurhasanah, 2016).

Based on this background, it needed research about the implementation of mind maps in improving the Elementary School Teacher Education students' creativity through the learning process of the Integrated Natural Science of Elementary Schools course. This

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research is very necessary because with the implementation of this research it can contribute to improve and prepare the human resources of prospective teachers (Elementary School Teacher

Education students), that the good quality of human resources will also affect the learning process conduct in the elementary schools later.

B. Research Methodology

The type of this research is a classroom action research that is used to improve learning processes that are carried out scientifically. This research was conducted in the third semester of the 2019/2020 school year.

This study uses Kemmis and Mc Taggart's research design (in Kunandar, 2011:43) with four stages in each cycle, namely the planning stage, acting stage, observing stage and reflecting stage.

The subjects in this study were the students of Elementary School Teacher Education who took the class of Integrated Natural Science of Elementary Schools, from 3G class,

Elementary School Teacher Education Study Program, Faculty of Teacher Training and Education, UST Yogyakarta with a total of 44 students, with 12 male students and 32 female students. The object of this research is the students' creativity of Elementary School Teacher Education in the course of Integrated Natural Science Education of Elementary Schools. The techniques of collecting data are using observation, questionnaires, and documentation. The data were analyzed using descriptive analysis techniques assisted with the percentage of creativity improvements.

C. Research Result and Discussion

Before taking action, the researcher conducts initial observations related to the problems that exist in the lecture process of the Integrated Natural Science Education of Elementary

Schools course in the 3G class, Elementary School Teacher Education, Faculty of Teacher Training and Education, UST Yogyakarta. The observation results show that the

students' creativity of 3G class of Elementary School Teacher Education, Faculty of Teacher Training and Education, UST Yogyakarta are still very low. This is proved by the low students' ability to convey thought or ideas, lack of high curiosity, and homogeneity of the work produced.

If these problems are ignored, it will affect the quality of the human resources who will teach at the elementary school level and it will also affect the quality of their students. So it needs a solution to overcome these problems. The alternative solution that can be done is to implement the mind map method in the Integrated Natural Science of Elementary Schools course.

This research was conducted in 2 cycles with two lecture meetings in each cycle. The research was implemented in accordance with the plans that had been prepared previously. This cycle 1 was held in two meetings. The first meeting was held on October 2, 2019, with the mind map application material of natural science material on grade I elementary school with the theme of Myself. While the second meeting was held on October 9, with the mind map application material on grade 2

elementary school with the theme of living in harmony.

The planning for cycle 1 was conducted by designing a learning process design with mind map application material on Natural Sciences material of grade I and II Elementary Schools with the theme of Myself and living in harmony. The design is made using the mind mapping method. Also at this stage, the observation and questionnaire instruments were made to measure the students' creativity improvement in the learning process.

The implementation of the mind map method begins with the learning process opening by the lecturer and continues with prayer. The lecturer explained the learning process that will be done, which will be implementing the mind map method. The lecturer explained what is the mind map, the steps, and its functions. Lectures continued by showing the good and right examples of mind maps. Furthermore, the lecturer explained the learned material and reminded that at the end of the learning process students must summarize the material presented with a mind map.

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The observation results in cycle 1 about students' creativity can be seen in the following table.

Table 1. The Students' Creativity Observation Results of Cycle 1

No.	Aspects	%	Category
1	Have a great curiosity	69,31	Good
2	Developing or enrich other people's ideas with detailed	63,63	Good
3	Frequently asking the questions that have quality	75,56	Very Good
4	Able to convey varied ideas toward the existing problem	74,43	Very Good
5	Able to argue spontaneously and not be shy	65,34	Good
6	Have a high imagination	70,45	Good
7	Glad to try new things	67,04	Good
8	Able to provide interpretation toward existing problems	62,5	Deficient
Average		68,53	Good

The reflection result in cycle 1 is there is still a lack average of students' creativity that appear. The mind map created is still homogeneous (similar to one another). Because the average obtained has not yet reached the indicator of success, it was decided to

JPSD Vol. 6 No. 1, Maret 2020
 ISSN 2540-9093
 E-ISSN 2503-0558

proceed with cycle 2. The lecturer also showed the results of the mind map that had been done in cycle 1 and conduct the evaluation together. With this reflection activity, students can take points that must be considered in making a mind map on the next meeting.

Cycle 2 was held in two meetings. The first meeting was held on October 16, 2019, with the mind map application material on grade 3 elementary school science material with the theme of Breeding Animals and Plants. While the second meeting was held on October 23 with the mind map application material on grade 4 elementary school material with the theme of always saving energy.

The planning stage in cycle 2 is planning more interesting learning from the cycle 1. Because in cycle 1, there are still many homogeneous mind maps, the thing that will be done by the lecturer is to re-emphasize the steps that must be considered in the mind map and to remind the results of reflections that have been done at the end of the previous learning.

The implementation activities are carried out with opening, core and closing activities. In the opening

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activity, the lecturer opens the learning with greetings, prayers, and reminds the material that has been delivered before. In the core activity, the lecturer explained the material that related to natural science theory on grade 3 at the first meeting and grade 4 material at the second meeting. The lecturer also explained the integration between science subjects with the other subjects of each learning that existed on the sub-themes and existing themes. At the end of the lecture, students are asked to make a summary with a mind map. The mind map is made as creative as possible. Students are given the freedom to make mind maps.

The observation results in cycle 2 about students' creativity can be seen in the following table.

Table 2. The Students' Creativity Observation Results of Cycle 2

No	Aspects	%	Category
1	Have a great curiosity	84,65	Very Good
2	Developing or enrich other people's ideas with detailed	85,79	Very Good
3	Frequently asking the questions that have quality	83,52	Very Good
4	Able to convey varied ideas toward the existing problem	81,81	Very Good
5	Able to argue spontaneously and not be shy	81,25	Very Good
6	Have a high imagination	84,09	Very Good
7	Glad to try new things	88,06	Very Good
8	Able to provide interpretation toward existing problems	89,20	Excellent
Average		87,64	Very Good

The observations above show that the average score of students' creativity reaches 87.64%. Because the indicators of success in this research have been achieved, this research was stopped in cycle 2.

Comparison of the average students' creativity on cycles 1 and 2 in this research can be seen in the following diagram.

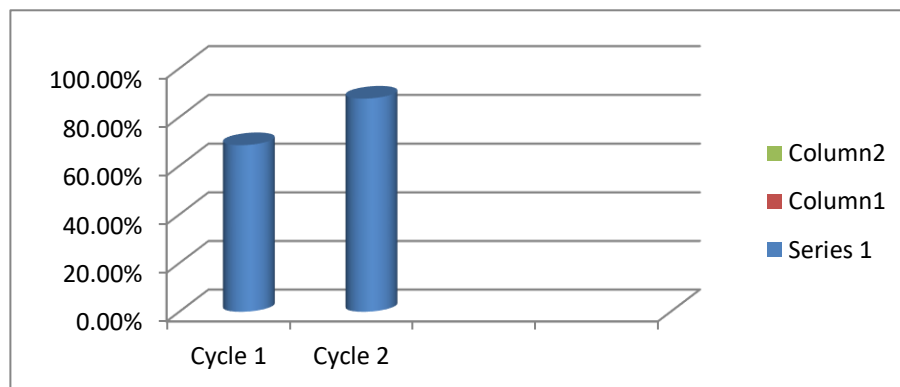


Chart 1. Comparison of The Average Students' Creativity On Cycles 1 and 2

The results of this research show that the mind map is able to improve Elementary School Teacher Education students' creativity of, Faculty of Teacher Training and Education, UST Yogyakarta in Integrated Natural Science Education of Elementary Schools course. The mind map implementation can be implemented at all levels by adjusting the abilities of students that are encountered. This is reinforced by researches that conducted by Zulyani (2014), Kristiana (2016) as well as the research conducted by Sormin (2018) which shows that the mind map method applied in college can improve students' learning outcomes. Chamdani (2017) also explained that mind maps can improve students' soft-skills.

The mind map method is also suitable to be implemented in elementary, junior high, and high schools. This is indicated by the results of research that conducted by Syam and Ramlah (2015), Anggraini (2016), Susanti (2016), Fauziah (2017), and Ananda (2019) which states that mind maps are very suitable to be implemented in elementary schools. At the junior high school level, mind maps are also proven to be able to improve the understanding of concepts in the learning process as has been done by Prihatinningsih (2012), Ningroem (2013), Suherlin, et al. (2017), Santi, et al. (2017) dan Sholeha, et al. (2019).

At the high school level, the researches that related to mind maps were conducted by Kamelia, et al. (2017), Permatasari, et al (2013), Sari

and Afgani (2008), Fauziah and Atalas (2016), as well as research conducted by Putri, et al. (2015) shows that mind maps affect the ability of students' creativity.

The mind map method is proven to be able to improve the students' creativity and learning outcomes if it is really implemented well (Fatmawati,

2014). Mind maps can be implemented not only in the learning process, but can also be implemented in their daily lives in analyzing information obtained in everyday life. So it can be concluded that mind maps are very necessary and important to be taught and familiarized in various levels of education.

D. Conclusion

Based on the explanation above, it can be concluded that the mind map method is able to improve the students' creativity of 3G class on the course of Integrated Natural Science Education of Elementary Schools. This is proved by the percentage improvement of cycle 1

by 68.53% (Good) to 87.64 (Very Good) in cycle 2. The suggestion given related to the mind map method is the need to implement the mind map method in the learning process, so the students can have good creativity and learning outcomes.

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