The Effectiveness of Mind Mapping Method on Creativity and Learning Outcome of Natural Science Subject in the Grade 5 Muhammadiyah Karangturi Elementary School in the Academic Year of 2018/2019

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Abstract. Background of this research is the low Natural Science learning outcomes. This research aimed to 1) understand the effectiveness of mind mapping method for creativity. 2) Understand the effectiveness of mind mapping method on learning outcomes. 3) Understand the effectiveness of the mind mapping method for creativity and learning outcomes. This research was a quasi experimental design. The research population was all fifth grade students in Muhammadiyah Karangturi Elementary School with the total number of control class (VA) is 20 and experimental class (VB) is 20. The dependent variable in this research was the creativity and learning outcomes of Natural Science subject. The independent variable was the learning method. The data collection techniques were by test and documentation. The analysis used the parametric test. The results of the research showed that 1) the mind mapping learning method is effective in term of creativity, which obtained value of asympt. Sig 0,000 <0,05. 2) The mind mapping learning method is effective in term of learning outcomes, which obtained value of asymp. Sig 0,000 <0,05. 3) The mind mapping learning method is more effective than conventional methods in term of creativity, which obtained creativity value of asymp. Sig 0.001> 0.05 but not with the learning outcomes, which obtained value of asymp.Sig 0,276 > 0,05.

Keywords: mind mapping method, creativity, natural science learning outcomes.

1 Introduction

This Word document can be used as a template for papers to be published in EAI Proceedings. Follow the text for further instructions on text formating, tables, figures, citations and references. The existence of learning methods is to create a classroom atmosphere that active, pleasant, not boring, and students enthusiastic about learning.“Joyful learning as a kind of learning process or experience which could make learners feel pleasure in a learning scenario/process” (Wei, Hung, Lee, & Chen, 2011) which means that fun/joyful learning is a learning process or learning experience that makes students feel pleasure in the learning scenario or learning process. In the learning process will be applied the learning method of mind mapping. The mind mapping method is an innovative understanding concept that can improve students’ learning outcomes. Learning outcomes are obtained from the learning process and the establishment of interaction between students and teachers.

All mind mapping has common things that is by using color and having a natural structure that radiates from the center, using curved lines, symbols, words, and images that in

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accordance with the brain's way of working. In addition to the right methods, creativity can also support students' learning outcomes(Buzan, 2012). Based on this explanation, the learning process using the mind mapping method is expected to have a positive impact on the creativity and learning outcomes of fifth grade students in Muhammadiyah Karangturi Elementary School.

Characteristics of creativity can be grouped into two categories of cognitive and non-cognitive (Rachmawati, Yeni, 2017) .Cognitive characteristics are originality, flexibility, fluency, and elaboration. While the learning outcomes according to Bloom's opinion (Thobroni, 2011) was broadly divided into three domains of cognitive, affective, and psychomotor. Based on the three mentioned realms, experimental research on students' learning outcomes in the form of values from the cognitive realm. Cognitive domain according to bloom taxonomy of Anderson & Kratwolh's revision (Darmawan & Sujoko, 2013) is remember, understand, apply, analyze, evaluate, and create.

2 Research Method

The method was by an experimental method with a quasi experimental design and the design form of nonequivalent control group design (sugiyono, 2017)

Table 1. Research Design

Group	Pretest	Treatment	Posttest
Experiment	O_1	X	O_2
Control	O_3	-	O_4

The sample in this research was the saturated sampling technique where all members of the population were used as samples. This research used cognitive achievement test and assignment test. Documentation was carried out with the aim of taking data in the form of pictures/photographs that illustrate the events at the time of the research. There were two instruments in this research, which were treatment instrument in the form of lesson plan and measurement instrument of tests. This research used content validity and construct validity. In this research, there was a normality test, a homogeneity test, and a hypothesis test using a parametric test of paired sample t test and independent sample t test.

3 Result and Discussion

3.1 The effectiveness of mind mapping method in term of creativity

Paired sample t test was conducted to determine the effectiveness of the mind mapping method towards creativity. The hypotheses in this research are as follows.
Ho : Learning with the mind mapping method is not effective in term of creativity

Hα : Learning with the mind mapping method is effective in term of creativity
Paired sample t test result can be seen in the table 2.

Table 2
Paired sample t test of creativity

Data	Pretest-posttest 5B	Asymp. Sig. (2-tailed)	Explanation
Creativity		0,000	H_o Rejected

Based on the analysis result of the experimental class creativity paired sample t test obtained value of asymp. Sig 0,000 <0,05 then Hα accepted. It can be concluded that the mind mapping learning method is effective on creativity. The result of the research is effective because the mind mapping made by students contained creative characteristics of originality, fluency, flexibility, and elaboration. Mind maps made by students can be varied due to the emotions and feelings contained in students at any time (Purnamiati, 2017). The pleasant atmosphere in the learning process affects the mind maps created by students. Similar with those opinion, through mind mapping activities in groups, students are able to develop creativity, build cooperation to understand the material, discipline, take responsibility for the tasks given, and be honest (Sari, Eka novita, 2017)

3.2 The effectiveness of mind mapping method in term of learning outcomes

Paired sample t test was conducted to determine the effectiveness of the mind mapping method towards learning outcomes. The hypotheses in this research are as follows.
Ho : Learning with the mind mapping method is not effective in term of learning outcomes
Hα : Learning with the mind mapping method is effective in term of learning outcomes
Paired sample t test result can be seen in the table 3.

Table 3
Paired sample t test of learning outcomes

Data	Pretest-posttest 5B	Asymp. Sig. (2-tailed)	Explanation
Learning Outcomes		0,000	H_o Rejected

Based on the analysis result of paired sample t test of learning outcomes obtained value of asymp. Sig 0,000 <0.05 then Hα accepted. It can be concluded that the mind mapping learning method is effective on learning outcomes. This is consistent with the result of Harjianti's research (Harjianti, 2018) which stated that the mind mapping implementation in the learning process can improve learning outcomes. This is because the use of colors and lines when recording subject material with mind mapping is more effective for remembering and understanding the learning material. In line with those opinion, DePorter & Nourie stated that the students' activities in making a mind map from books that they just read will increase understanding and memory (Imaduddin, Muhammad Chomsi dan Utomo, 2012). This is in accordance with the result of Nirmalasari's research which was learning using mind map helps students compile information in the material form that is easy to understand and remember (Nirmalasari, 2013).

3.3 The effectiveness of mind mapping and conventional methods in term of creativity

Independent sample t test was conducted to determine the effectiveness of the mind mapping method compared to conventional method towards creativity. The hypotheses in this research are as follows.
Ho : Learning with the mind mapping method is no more effective than conventional method in term of creativity
Hα : Learning with the mind mapping method is more effective than conventional method in term of creativity
Independent sample t test result can be seen in the table 4

Table 4
Independent sample t test of creativity

Data	posttest 5B	Asymp. Sig. (2-tailed)	Explanation
Creativity		0,001	H_o Rejected

Based on the analysis result of the independent sample t test of creativity, obtained value of asymp. Sig 0.001 <0.05 then Hα accepted. It can be concluded that the mind mapping learning method is more effective than conventional method in term of creativity. This happens because there are differences in the thinking ability of creative traits between the experimental class and the control class (Putri, 2016). The students' high creativity in the mind mapping learning method is able to connect new (originality) and unique ideas to the existing ideas (Silaban & Napitupulun, 2011), by utilizing interesting colors and symbols that will create the new and different maps stated that this is because conventional learning method use more lecture method in learning, making it difficult to solve and make decisions As the implication of conventional learning, students accept what is given by the teacher without wanting to try to find the concepts by themselves.

3.4 The effectiveness of mind mapping and conventional methods in term of Learning Outcomes

Independent sample t test was conducted to determine the effectiveness of the mind mapping method compared to conventional method towards learning outcomes. The hypotheses in this research are as follows.
Ho : Learning with the mind mapping method is no more effective than conventional method in term of learning outcomes
Hα : Learning with the mind mapping method is more effective than conventional method in term of learning outcomes
Independent sample t test result can be seen in the table 5

Table 4
Independent sample t test of learning outcomes

Data	posttest 5B	Asymp. Sig. (2-tailed)	Explanation
Learning		0,276	H_o Accepted

Outcomes

Based on the analysis result of the independent sample t test of learning outcomes obtained value of asymp. Sig 0.276> 0.05 then Ho accepted. It can be concluded that the mind mapping learning method is no more effective than conventional method in term of learning outcomes. According to (Nurroeni, 2013) The acceptance of the null hypothesis (Ho) in this study is not absolutely due to the actions given, but because of the error. In line with this opinion, Sulipan (Nurroeni, 2013)stated that there are two kinds of error, which are (1) constant error and (2) non-constant error. Constant error is the result of an extra variable that is always present in every experiment. This variable cannot be known, cannot be measured, difficult to control, and not easy to be calculated and separated by differences in the results generated by the research variables. While non-constant error occurs in one or several groups but does not occur in one other group in the research. Non-constant error may be noticed or controlled when preparing research or determining the research patterns.

Conclusion

Based on the results and discussion of the research at Muhammadiyah Karangturi Elementary School, it can be concluded that the mind mapping learning method is effective in term of creativity. This can be proven by the result of value of asymp. Sig 0,000 <0,05. Mind mapping learning method is effective in term of learning outcomes. This can be proven through the result of value of asymp. Sig 0,000 <0,05. Mind mapping learning method is more effective than conventional method in term of creativity. This can be proven through the result of value of asymp. Sig 0.001 <0,05. While the mind mapping learning method is no more effective than conventional method in term of learning outcomes. This can be proven through the result of value of asymp. Sig 0.276> 0.05.

References

Buzan, T. (2012). *Buku Pintar Mind Map*. Jakarta: Gramedia.

Darmawan, I. P. A., & Sujoko, E. (2013). REVISI TAKSONOMI PEMBELAJARAN BENYAMIN S. BLOOM. *Satya Widya*. https://doi.org/10.24246/j.sw.2013.v29.i1.p30-39

Harjianti, N. R. (2018). *Pengaruh Mind Mapping Terhadap Hasil Belajar IPS Pada Siswa Kelas 3 di Sekolah Dasar Negeri 2 Genengsari Kecamatan Kemusu Semester II Tahun Pelajaran 2015/2016*. Yogyakarta.

Imaduddin, Muhammad Chomsi dan Utomo, U. H. N. (2012). Efektivitas Metode Mind Mapping untuk Mengingkatkan Prestasi Belajar Fisika pada siswa kelas VIII. *HUMANITAS*, *IX*.

Nirmalasari, D. (2013). . Studi Komparasi Penggunaan Media Mind Map Dan Crossword Puzzle Pada Metode Proyek Ditinjau dari Kreativitas Siswa Terhadap Prestasi Belajar Pada Materi Pokok Sistem Koloid Kelas XI Semester Genap SMA N 1 Banyudono Tahun Pelajaran 2012/2013. *Jurnal Pendidikan Kimia (JPK)*, *2*.

Nurroeni, C. (2013). KEEFEKTIFAN PENGGUNAAN MODEL MIND MAPPING TERHADAP AKTIVITAS DAN HASIL BELAJAR IPA. *Journal of Elementary Education*, *2*.

Purnamiati, G. A. K. D. ; dkk. (2017). Pengaruh Penerapan Model Pembelajaran Kooperatif Tipe Mind Mapping Terhadap Kreativitas dan Prestasi Belajar IPA Siswa Kelas VI SD No. 3 Benoa Kabupaten Badung. *PENDASI: Jurnal Pendidikan Dasar Indonesia*.

Putri, L. O. L. (2016). Mind Map Sebagai Model Pembelajaran Menilai Penguasaan Konsep dan Alat Evaluasi Menilai Kemampuan Berpikir Kreatif Siswa. *Seminar Nasional Dan Saintek.*, 629–634.

Rachmawati, Yeni, dan E. K. (2017). *Strategi Pengembangan Kreativitas pada Anak Usia Taman Kanak-kanak.* Jakarta: Kencana.

Sari, Eka novita, dkk. (2017). PENGARUH MODEL PEMBELAJARAN DISCOVERY LEARNING DENGAN MIND MAPPING TERHADAP HASIL BELAJAR SISWA PADA MATERI SEL DI

SMA. *USEJ: Unnes Science Education Journal*. https://doi.org/10.15294/usej.v5i3.13171

Silaban, R., & Napitupulun, M. A. (2011). Pengaruh Media Mind Mapping Terhadap Kreativitas dan Hasil Belajar Kimia Siswa SMA Pada Pembelajaran Menggunakan Advance Organizer. *Jurnal*.

sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif dan R & D.Bandung*. Bandung: Alfabetha.

Thobroni, M. dan A. M. (2011). *Belajar dan Pembelajaran (Pengembangan Wacana dan Praktik Pembelajaran Dalam Pembangunan Nasional)*. Yogyakarta: Ar Ruzz Media.

Wei, C. W., Hung, I. C., Lee, L., & Chen, N. S. (2011). A joyful classroom learning system with robot learning companion for children to learn mathematics multiplication. *Turkish Online Journal of Educational Technology*.