Al-Ishlah: Jurnal Pendidikan
Vol.14, 4 (December, 2022), pp. 5189-5198
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v14i4.2318

The Effect of The Application of The Mind Mapping Learning Model to Improve The Critical Thinking Ability of Elementary School Students in Tanggulangin

Aulya Firda Trisnawati[1], Akhtim Wahyuni[2]

[1] Universitas Muhammadiyah Sidoarjo, Indonesia; aulyafirdatrisnawati@gmail.com
[2] Universitas Muhammadiyah Sidoarjo, Indonesia; awahyuni@umsida.ac.id

ARTICLE INFO

Keywords:

Thematic Learning,
Mind Mapping;
Learning Methods;
Critical Thinking Ability

Article history:

Received 2022-03-10
Revised 2022-07-15
Accepted 2022-11-21

ABSTRACT

Thematic learning in the 2013 curriculum requires students to be more active and think critically. The ability to think critically is essential for students, especially facing the challenges of the 4.0 era. In reality, the elementary school students in Tanggulangin cannot yet think critically. Most students answer essay questions without being able to describe them in detail. This study was conducted to analyze how the application and results of the mind mapping learning model improve students' critical thinking skills. The research method used is the class action research method. The object of his research was a grade V student of the Elementary School in Tanggulangin. The techniques used in this study are observation and test techniques. The results showed: (1) The application of the mind mapping learning model to improve students' critical thinking skills was carried out in 4 stages compiling an Action design, applying a mind mapping learning model, observing the results obtained from the application of the mind mapping model and evaluation. (2) The results of the mind mapping learning model show that the percentage of students' critical thinking ability with mind mapping media has increased from cycle 1 to cycle two by 24.15%. Further research is expected to be carried out with diverse respondents, with more than two-cycle stages, to analyze the percentage of the graph produced more significantly

Corresponding Author:
Akhtim Wahyuni
Universitas Muhammdiyah Sidoarjo, Indonesia; akhtimwahyuni@gmail.com

1. INTRODUCTION

Education is an essential element in human life because education aims to develop human potential to be of higher quality in terms of intellectuality and morals **(Syafrial Davi & Susilo, 2017)**. Human beings need means of interaction it can obtain through education. When it comes to education,

it will be closely related to the institution that runs it, namely schools (Khasanah, 2015).The education carried out by the school is tiered, starting from basic to higher education. This level requires teacher-led groups in the classroom for the teaching and learning process (Kurniawan, 2015).

Primary education is an essential component of the Education system. Referring to the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, primary education includes SD/MI, SMP/MTS, or other equivalent forms. At the same time, elementary schools are educational institutions that organize six-year educational programs for children aged 6 to 12 years. The age of 6-10 years is also referred to as the period of elementary school, which is the maturation period for study or school. At this time, children are easier to direct, given tasks to be completed, and tend to be easy to learn various habits such as eating, sleeping, waking up, and studying at their time and place compared to the pre-school period (Kurniawan, 2015).

The implementation of primary school aims to foster children's attitudes and abilities, equipping children with essential knowledge and skills needed in social life. Furthermore, primary education is designed to prepare students to enter high school. The subjects of Natural Sciences (IPA), Social Sciences (IPS), Indonesian, Mathematics, English, Culture and Arts, and Regional Languages are part of primary education. Basic education conceptualizes learning in the current curriculum by combining the content of subjects from several subjects into a single whole and then packaging them into the form of topics, which are currently referred to as the 2013 curriculum.

When taking Basic Education, students need to be trained in critical thinking. The ability to think critically significantly affects future survival, especially when undergoing the 4.0 era. According to Robert Ennis in Alec Fisher (2008:4) in (Rachmadtullah, 2015), critical thinking is "*Critical thinking is thinking that makes sense and focused reflection to decide what should be believed or done*" means reasoning and focusing on deciding what should be done. Critical thinking must cultivate the ability to think critically early, so students are accustomed to critical and creative thinking patterns. Critical thinking skills are not necessarily acquired casually; the process needs to be trained. The process of being trained can be interpreted as the process of honing and communicating ideas and ideas that arise (Suci et al., 2019).

In reality, teachers have not instilled critical thinking skills in students, so many students have not honed their critical thinking skills. The phenomenon of low critical thinking skills of researchers was found in grade V students at Tanggulangin, where students were still unable to reason and analyze every problem. Students have difficulty in reviewing the material because students predominantly use the same explanations as the notes given by their teachers. Not only that, but students also find it difficult to relate a concept to the topic of material that the teacher is giving during learning. 75% of students were found to be incapable of critical thinking.

The above statement is proven by the results of students' answers when taking exams at school. Almost all essay questions are answered with a short explanation without being described to the maximum. It is because students are used to reviewing the discussion of the material with the same sentences as what is explained by the teacher and have difficulty relating concepts to each learning material. In this case, teachers can use diverse and innovative learning models/strategies to instill critical thinking skills in elementary school students to be more interested and actively participate in learning.

The learning model is essential in learning and teaching because it can usher in the learning process, becoming easier for students to understand. The learning model is a determinant of the success of a learning process and can also be a consideration if you want to improve the quality of learning. According to Winaputra (Thamrin Tayeb, 2017), the model is a conceptual framework used as a guide for carrying out an activity while learning is an interaction between teachers and participants, both face-to-face and indirectly face-to-face.

The learning model is a conceptual framework that describes a systematic procedure for organizing learning experiences to achieve specific learning goals and also serves as a reference for the compilers of learning concepts and teachers in planning and implementing activities (Thamrin Tayeb,

2017). In addition, the learning method/model is a form of learning design that shows the occurrence of the learning process; in other words, it is interpreted as the way educators teach students. Learning models' benefits are motivation, facilitating understanding, and increasing learners' attention (Halik, 2019).

This Study was to apply learning model strategies to provide an increase in critical thinking by applying Mind Mapping. According to (Tony Buzan, 2004), mind mapping is a creative and effective way of taking notes, able to "map" our mind, then quickly enter and extract information from the brain. The mind Mapping method is a creative learning method so that students are trained in identifying essential ideas from each material, where these critical ideas are connected in the form of charts whose content is given pictures, symbols, and words that are colored so that the chart contains concepts from one subject matter. The author tried to trace the previous research, then obtained a study conducted by (Dewi Tri Windia, 2020) entitled "The Influence of the Application of Analytical Mind Mapping Models in Topic Learning on Students' Critical Thinking Ability at SD Negeri 02 Petungsewu Wagir Malang V" which is related to this research. The similarity between Dewi Tri Windia's research and this research is that they both use a mind map learning model to improve students' critical thinking skills in topic learning. The difference is that Dewi Tri Windia's research focuses on discussing the topic as a whole.

In contrast, this research focuses on topic 5, subtopic 1, and learning 1, which only covers science and Indonesian subjects. In addition, (Wyn Listyawati et al., n.d.) conducted another study entitled "The Effect of The Quantum Learning Assisted Mind Map Model On The Critical Thinking Ability Of Elementary School Five Students In Science Learning." The difference with this research is that the research by ni Wyn Listyawati prioritizes the quantum learning model for improving critical thinking ability; mind Mapping is only used as a second party. Meanwhile, in this study, Mind Mapping was used as the first party to improve critical thinking skills in elementary science learning.

This study's findings show that using quantum learning models with Mind Mapping can improve students' critical thinking skills. Through the syntax/steps used in this study, namely students making mind mapping in a group discussion and presented, the process concluded that this learning model has a unique and robust impact on students' critical thinking ability. By discussing, students can exchange ideas and interpret information expressed in the mind map. With the presentation, students can evaluate information based on the discussion results.

The thematic learning model in 2013 that is currently being implemented requires students to be more active in the learning process and think more critically, while most elementary school students in Tanggulangin cannot think critically. In addition, the ability to think critically is an important thing that students must have, especially facing the challenges of the 4.0 era. Based on the above problems, researchers will try to discuss how to apply the mind mapping learning model to improve the critical thinking skills of elementary school students in Tanggulangin.

2. METHODS

This research was conducted with respondents of Class V elementary school students in Tanggulangin for subject learning in five sub-themes, one component of learning, and one component of the classroom action research ecosystem, which systematically reflects various teacher actions to improve learning conditions in the classroom. It used classroom action research to implement strategies that could improve elementary school students' city thinking ability in Tanggulangin.

According to Subyantoro (Mufidah, 2020), class action research is observation in the classroom that is reflective by carrying out a specific action aimed at improving or improving the quality of teaching practice. For example, if the achievement of student learning outcomes in a class does not show good results and can hinder the specified target, the teacher can take class action to correct the problem.

Meanwhile, Suharsimi Arikunto (Suharsimi Arikunto et al., 2006), classroom action research is an observation of learning activities that are deliberately proposed in the form of actions and coincide in

the classroom. The teacher directs the action, which the student then carries out under the teacher's supervision.

The following classroom action research design by adopting designs from Kemmis and Taggart (Susilowati, 2018), is: 1) Phase 1: planning, a design of actions or planning is prepared Learning tools, namely the Syllabus and assessment instruments; 2) Phase 2: implementation of actions, the application of the mind mapping learning model is carried out to improve students' critical thinking skills on theme six sub-themes 2 learning 1; 3) Phase 3: observation, based on the results of applying the mind mapping model; and 4) Phase 4: reflection, conduct reflection or evaluation to reiterate things that need to be improved.

The instruments used by researchers include 1) Device instruments The learning tool instruments used by this researcher include the learning syllabus, teaching materials, and assessment; and 2) Question Instruments The question instrument used in this class action research is intended to collect data to find out the results of the application of Mind mapping media to improve the critical thinking skills of Elementary School Students in Tanggulangin with theme six subtheme. There are two types of question instruments, namely a) Pretest. The test is used to determine the initial condition of students in learning using mind mapping; this test is carried out before students learn mind mapping; and b) Postest Tests are given to students after getting mind mapping learning. This test is used to determine the learning outcomes of improving critical thinking skills experienced by students after applying the mind mapping learning model.

Data collection is carried out in various stages, namely:

1. Observations. Observations were made to children and teachers, this stage was carried out by researchers to students, observations were made to identify, and collect data from each indicator during the learning process. The function of observation is to find out the extent of the process of the students to be researched. Aspects observed include a) Student responses in receiving learning materials; b) Response to media; c) The number of students who are able to follow well the learning activities; and d_ The number of students who do not focus on participating in learning activities.
2. Test. Test is a procedure to obtain valid and timely information about a person by using a systematic and objective tool or procedure (Suharsimi Arikunto et al., 2006). The purpose of this test is to assess students' critical thinking skills as they answer questions. This test is also used to assess the extent to which students' critical thinking processes have developed.

The data sources used in this study were the results of filling out observation sheets for improving the critical thinking skills of class V students. Qualitative data analysis was used to analyze data from interviews and observations. Meanwhile, quantitative data analysis was used to analyze the score from the observation sheet. To find out the results of increasing students' critical thinking skills after the application of the *Mind Mapping*, the researchers used the formula:

1. Average Assessment of All Students Observation Sheet
   The formula used to determine the average score of the student's critical thinking ability observation sheet for all fifth graders is as follows:
   $$\text{Average Value} = \frac{Total\ Score}{Number\ of\ Students}$$
2. Category Increased Percentage of Critical Thinking Ability of Students
   Table to determine the category as a benchmark in determining the improvement of students' critical thinking in learning theme 6.

Table 1 Table of Percentage of Critical Thinking Ability

Category	Range of Score
Very Good	75,01%-100%
Good	50,01%-75%
Fairly Good	25,01%-50%
Not Good	0,01%-25%

3. FINDINGS AND DISCUSSION

At the planning stage, the subject to be studied is determined in grade V elementary school students in Tanggulangin by the observation results through the pretest that is distributed and designed learning instruments per the specified subject. Furthermore, the implementation of actions in cycle one is carried out by the learning design on the instrument and applies the syntax/steps that have been designed. The learning stage begins with opening activities and core and closing activities.

In the opening activity, students prayed, made groups, and read the material to be studied. In the core activities, the teacher briefly discussed the material on theme 6 of heat transfer and explanatory text. The teacher explains the learning media of mind mapping. Here, the teacher explains the creation and application of media. Then students do mind mapping in groups according to the learning materials on that day. Mind mapping combines the subject matter with the appropriate discussion by grouping it in a box or permission, such as making a concept map. After the practice is completed, each group is required to present the mind mapping that has been made. After the action in cycle one is completed, further observation is carried out.

The results of the provision of cycle 1 actions still have not produced an increase according to the target success indicators. The teacher corrects the results of the student's work. Students seem confused and do not mean it in mind mapping. Because many imitate the results of their friends, so many explanations do not match the main discussion. In this cycle 1 process, it was seen that the ability to think critically was still not improved.

In Cycle 1, many students' work results do not match the indicators of success. Therefore cycle 2 must be carried out. In cycle 2, elementary school students are given the same action as in cycle I, starting with the opening, core, and closing activities. In the core activities, changes were made with explanations and provided examples of making mind mapping in groups so that the research results in cycle II could be further improved and in accordance with success indicators.

In cycle 2, explanations and practices are emphasized more. Students combine the topic of discussion with the appropriate branch of discussion. All students are considered and required to be independent so that the improvement of critical thinking skills can be comprehensive. Each group member must participate in creating a shared portfolio. After that, it will present the mind mapping work in front of the class. This process makes students get used to thinking critically in every learning, not only relying on readings in the theme book. After flexing, it is seen In cycle 2; there is an increase according to the indicators of success.

The study results refer to the research stages in cycle one and cycle 2. The results showed an increase in cycle one and cycle 2. In cycle 1, the average value was 71.25 (classified as a low category), and the average value in cycle 2 was 95.4 (classified as an excellent category). It proves an increase in critical thinking of elementary students at Tanggulangin Sidoarjo by applying the Mind Mapping learning model with an increase in numbers of 24.15. The table shows a recapitulation of the acquisition of value from applying the Mind Mapping learning model.

Tabel 1. Value Data For Cycle 1 and Cycle 2

	Cycle 1	**Cycle 2**
Average Value	71.25	95.4

Furthermore, the authors conducted a data normality test referring to the data table results above. The results of the normality test of the data can be seen in the table below :

Tabel 2. Tests Of Normality

			Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Kategori	Statistic	df	Sig.	Statistic	df	Sig.
Critical Thinking Ability	Cycle	Cycle 1	.323	24	.240	.777	24	.124
		Cycle 2	.269	24	.152	.752	24	.089

a. Lilliefors Significance Correction

Based on the significant value in table 3 of the normality test, it can see that the practical matter is > 0.05, so it can conclude that the data in Cycle 1 and Cycle 2 are typically distributed. Next, a paired sample t-test was conducted to see if there was an average difference between cycle one and cycle 2. The results of the test can be seen in the table below :

Tabel 3. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Cycle – Cycle 1 dan Cycle 2	9.39583 E1	2.94603	.42522	93.10290	94.81377	220.963	47	.000

Based on the SPSS output table 4, the sig value is obtained. value 0.000 <0.05, so it can be concluded that there is a difference between the value of critical thinking in cycle 1 and cycle 2, or the application of *mind mapping* has an effect on the critical thinking ability of fifth-grade elementary school students at Tanggulangin, Sidorarjo.

Based on Figure 2, we can see a graph of the results *of mind mapping application* in Cycle 1 and Cycle 2.

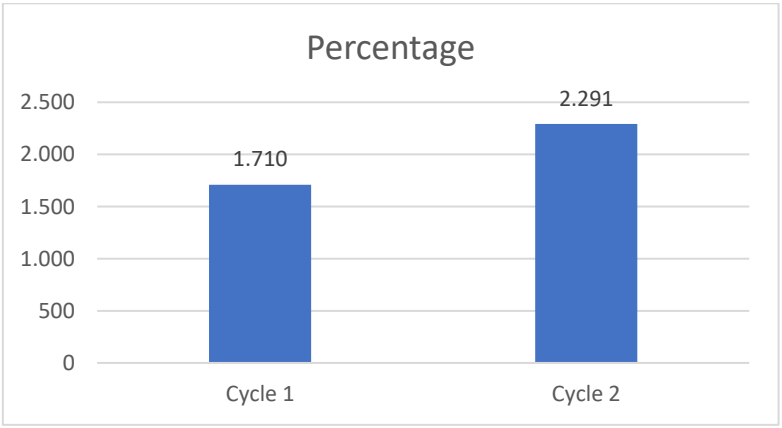

Figure 1. Graph of Student Mind Mapping Value Results in Cycle 1 and Cycle 2

Comparison of students' critical thinking skills with *mind mapping* on theme 6 sub-theme two about heat transfer and explanatory text, a comparison occurs in cycle one and cycle 2. The increase is significant and exceeds the success indicator set before the study, 80%. So it can state that the application of *Mind Mapping* can improve students' critical thinking skills in fifth-grade elementary school students at Tanggulangin, Sidorarjo.

According to Chance, Critical thinking is a deliberate process that aims to interpret and evaluate information based on existing experiences, beliefs, and abilities (Zakaria et al., 2019). As is known, the ability to think critically is indispensable for students. There are many theories related to critical thinking indicators (Fatmawati, 2014), which divides critical thinking activity indicators into five main activities; but in practice, one activity or just a few indicators can be separated a) gives a simple explanation; b) Building basic skills; c) Drawing the Conclution; d) Provide further explanation; dan e) Setting strategies and tactics.

Mind Mapping is a type of learning tool in helping students improve their critical thinking skills. Mind Mapping is also known as mind mapping. According to Hujodo (Sholahudin et al., 2021), mind map is the relationship between thematic concepts represented in a conceptual network, starting from the core of the problem and continuing to the supporting parts that are interconnected to form and generate knowledge, helping in the understanding of the learning topic Since it is carried out by mapping our mind, the mapping of the mind can be described as an effective method of note-taking, efficient, creative, engaging, simple, and efficient.

According to (Tony Buzan & Barry, 2004), mind mapping is a creative and effective way of taking notes, able to "map" our mind, then quickly enter and extract information from the brain. It can be mentioned that the Mind Mapping method is a creative learning method so that students are trained in identifying essential ideas from each material, where these critical ideas are connected in the form of charts whose content is given pictures, symbols, and words that are colored so that the chart contains concepts from one subject matter.

Mind Mapping is a technique that teaches students from the core of the problem to the supportive relationships, the relationship between theme concepts, and the like. Mind mapping is applied to strategies to increase students' critical thinking skills. Thinking guidelines Because it is conceptualized, graphs technical notes or writing indicators, providing simple knowledge or elaboration, forming basic skills, summarizing and making explanations effectively, efficiently, creatively, interestingly, and quickly. To solve it, think about it or map it out.

Based on the data already presented, there is an increase in the average value in cycles one and 2. Improving critical thinking skills in grade V elementary school students in Tanggulangin Sidoarjo is inseparable from applying the mind mapping learning model. In applying the mind mapping learning model, it has been mentioned above that four stages are carried out. Because cycle one has not yet reached the success indicator, the application of the mind mapping learning model is continued in cycle 2. After that, an increase in the average value was seen in cycles 1 and 2.

The Mind Mapping Learning Model can be efficient because it can shorten the time to learn information. This is due to the model's ability to present a complete picture of events in a short time so that it can help learn faster by switching to a more efficient and easy-to-understand recording mode. Students can use it to help them understand a concept or student material in general. When they create Mind Mapping, they are "forced" to associate new concepts with the knowledge they already have.

According to Michalko in his book (Tony Buzan, 2004), the Mind Mapping learning model can be used in various fields, including education, and Stimulates the whole brain. Starting a topic Helps in the formation of relationships between different pieces of data, Provides a clear picture of the big picture as well as specifics, Comparing and contrasting grouping concepts Each learning model or technology has its benefits. Using a mind map model gives an increase in memory, as well as being more creative.

Meanwhile, according to Kiranawati, as quoted by (Yondra et al., 2018), Mind Mapping has the following advantages: (1) It allows people to express their opinions freely; (2) Focus on one goal; (3)

Notes are more focused on the main points; (4) It's straightforward to see the big picture and; (5) helps the brain organize and form relationships; (6) Encourage the addition of new data; and (7) Faster reviews .The shortcomings of the mind mapping learning model (Agustina & Vina, 2013), are as follows (1) Only active students are involved, and (2) Students do not thoroughly learn.

Based on the arguments above, it can be concluded that although the mind mapping learning model has many advantages and can affect the critical thinking ability of elementary school students, there are shortcomings where only enthusiastic students about learning follow, and not all students are enthusiastic. As a result, some students find it difficult to follow the mind mapping learning model in the classroom.

4. CONCLUSION

The application of the mind mapping learning model to improve the critical thinking ability of students in Tanggulangin is carried out in 4 stages by compiling an action design, applying a mind mapping learning model, observing the results obtained from the application of the mind mapping model and evaluation. The results of the application of the *mind mapping* showed that the average The critical thinking ability of students increased. The increase in the percentage of students' necessary thinking skills with *mind mapping media* experienced growth in cycle 1 to cycle two as much as 24.15%

Although the application of the mind mapping learning model has a positive impact on improving students' thinking ability, this study has limitations. At the time of the study, the Government implemented 50% face-to-face learning and 50% online to reduce the transmission of the Covid-19 virus, so this study was only carried out on respondents who were limited to a short time.

Further research is expected to be carried out with a more significant and diverse number of respondents, not limited to elementary school students, considering that the Government has implemented 100% face-to-face learning. In addition, further research is expected to be carried out more than twice a cycle so that the percentage graph produced can be higher to support the results of this study or to analyze the resulting percentage graph more significantly.

REFERENCES

Agustina, & Vina. (2013). *Penerapan Mind Mapping Dalam Pembelajaran IPA Pada Materi Daur Daur Air Untuk Meningkatkan Kemampuan Kreatif Siswa (Penelitian Tindakan Kelas Pada Siswa kelas V SDN Cibodas Kecamatan Lembang Kabupaten Bandung Barat Tahun Ajaran 2012/2013*. UPI.

Dewi Tri Windia. (2020). *Analisis Penerapan Model mind mapping dalam Pembelajaran Tematik Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SD Negeri 02 Petungsewu Wagir Malang*. https://conference.unikama.ac.id/artikel/

Fatmawati, H. (2014). *ANALISIS BERPIKIR KRITIS SISWA DALAM PEMECAHAN MASALAH MATEMATIKA BERDASARKAN POLYA PADA POKOK BAHASAN PERSAMAAN KUADRAT (Penelitian pada Siswa Kelas X SMK Muhammadiyah 1 Sragen Tahun Pelajaran 2013/2014)*. *2*(9), 899–910. http://jurnal.fkip.uns.ac.id

Halik, A. (2019). *Penerapan Metode Pembelajaran Tematik pada Peserta Didik Tuna Grahita di Sekolah Luar Biasa (SlB)-ABCD Muhammadiyah Palu Kelurahan Lere Kecamatan Palu Barat Application of Thematic Learning Methods for Mentally Impaired Students in Special Schools (SLB)-ABCD Muhammadiyah Palu, Lere Village, West Palu District*. https://doi.org/https://doi.org/10.31934/jurnal%20iqra.v14i1.1555

Khasanah, A. (2015). PEMASARAN JASA PENDIDIKAN SEBAGAI STRATEGI PENINGKATAN MUTU DI SD ALAM BATURRADEN. *El-Tarbawi*, *8*(2), 161–176. https://doi.org/10.20885/tarbawi.vol8.iss2.art4

Kurniawan, M. I. (2015). Tri Pusat Pendidikan Sebagai Sarana Pendidikan Karakter Anak Sekolah Dasar. *Pedagogia : Jurnal Pendidikan*, *4*(1), 41–49. https://doi.org/10.21070/pedagogia.v4i1.71

Mufidah, L. (2020). *URGENSI PENELITIAN TINDAKAN KELAS DALAM MEMPERBAIKI PRAKSIS PEMBELAJARAN*. *04*, 168–177. https://doi.org/10.24127/att.v6521a1426

Rachmadtullah, R. (2015). KEMAMPUAN BERPIKIR KRITIS DAN KONSEP DIRI DENGAN HASIL BELAJAR PENDIDIKAN KEWARGANEGARAAN SISWA KELAS V SEKOLAH DASAR. *Jurnal Pendidikan Dasar*, *6*(2), 287. https://doi.org/10.21009/JPD.062.10

Sholahudin, M. S., Putra, D. A., Setiawan, F., Universitas,), & Surabaya, M. (2021). *Inventa : Jurnal Pendidikan Guru Sekolah Dasar META ANALISIS MENGGUNAKAN METODE MIND MAPPING DALAM MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS SISWA* (Issue 1). http://jurnal.unipasby.ac.id/index.php/jurnal_inventa

Suci, D. W., Firman, F., & Neviyarni, N. (2019). Peningkatan Keterampilan Berpikir Kritis Siswa Melalui Pendekatan Realistik di Sekolah Dasar. *Jurnal Basicedu*, *3*(4), 2042–2049. https://doi.org/10.31004/basicedu.v3i4.229

Suharsimi Arikunto, Suhardjono, & Supardi. (2006). *Penelitian tindakan kelas*. Bumi Aksara.

Susilowati, D. (2018). PENELITIAN TINDAKAN KELAS (PTK) SOLUSI ALTERNATIF PROBLEMATIKA PEMBELAJARAN. *JURNAL ILMIAH EDUNOMIKA*, *2*(01). https://doi.org/10.29040/JIE.V2I01.175

Syafrial Davi, F., & Susilo, H. (2017). *PENERAPAN MODEL BRAIN BASED LEARNING DENGAN MIND MAP UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS DAN HASIL BELAJAR SISWA KELAS IV DI SDN PENANGGUNGAN MALANG*. http://pasca.um.ac.id/conferences/index.php/sntepnpdas/article/view/872

Thamrin Tayeb. (2017). *ANALISIS DAN MANFAAT MODEL PEMBELAJARAN ANALYSIS AND BENEFITS OF LEARNING MODELS*. *4*(2), 2407–2451. https://doi.org/10.24252/auladuna.v4i2a5.2017

Tony Buzan. (2004). *Mind map untuk meningkatkan kreativitas*. Gramedia Pustaka Utama.

Tony Buzan, & Barry. (2004). *Memahami Peta Pikiran: The Mind Map Book*. Interaksa.

Wyn Listyawati, N., Suarjana, M., Nym Sudana, D., & Pendidikan Guru Sekolah Dasar, J. (n.d.). *PENGARUH MODEL PEMBELAJARAN KUANTUM BERBANTUAN PETA PIKIRAN TERHADAP KEMAMPUAN BERPIKIR KRITIS SISWA PADA PEMBELAJARAN IPA KELAS V SD*.

Yondra, O. :, Ramadhan, S., Asri, Y., & Arief, E. (2018). *PENGARUH TEKNIK MIND MAPPING TERHADAP KETERAMPILAN MENULIS TEKS EKSPOSISI SISWA KELAS X SMA NEGERI 1 KECAMATAN HILIRAN GUMANTI KABUPATEN SOLOK*.

Zakaria, I., Tri Priyatni, E., & Artikel Abstrak, I. (2019). *Dimensi Berpikir Kritis*. http://journal.um.ac.id/index.php/jptpp/