

## **IMPROVING STUDENT LEARNING OUTCOMES: BRAIN-BASED LEARNING WITH A MIND MAPPING MODEL AFTER THE COVID-19 PANDEMIC**

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### **ABSTRACT:**

*This article examines related learning methods that can attract learners to learn the subjects of the Curriculum with a brain-based learning approach or brain-based Learning. This method uses field research at Muhammadiyah 1 Prambanan Junior High School by interviewing several respondents, namely representatives of 7th-grade students, field observation, and documentation analysis using data in the form of documents and related data sources needed. Data analysis using Miles and Huberman methods is by data collection, data reduction, presentation of data, and withdrawal of conclusions or data verification. The research results show that the learning process with a brain-based learning approach with mind mapping methods significantly impacts learners' learning interest in the subjects of The Islamic Civilization (Tarikh) in Grade 7. The trial results showed that almost all pupils' grade scores increased, affecting average grades in each class. The learners' enthusiasm is also seen when they do mind mapping with great earnestness. However, in this learning model with mind mapping, some shortcomings exist. Namely, it will be difficult for students who are not interested to understand the material quickly.*

### **ARTICLE HISTORY:**

Received: 17 October 2022

Accepted: 23 November 2022

Published: 30 November 2022

### **KEYWORDS:**

*Brain-Based Learning,  
Mind Mapping,  
COVID-19 Pandemic*

### **ABSTRAK**

Artikel ini mengkaji terkait metode pembelajaran yang dapat menarik minat peserta didik dalam mempelajari mata pelajaran pada kurikulum 2013 dengan pendekatan pembelajaran berbasis otak atau *brain based learning*. Metode penelitian ini menggunakan penelitian lapangan di SMP Muhammadiyah 1 Prambanan, dengan mewawancarai beberapa responden yaitu perwakilan siswa kelas 7, observasi lapangan, dan analisis dokumentasi menggunakan data berupa dokumen dan sumber data terkait yang dibutuhkan. Analisis data menggunakan metode *miles and huberman* yaitu dengan pengumpulan data, reduksi data, penyajian data, dan penarikan kesimpulan atau verifikasi data. Berdasarkan hasil penelitian bahwa proses pembelajaran dengan pendekatan *brain based learning* dengan metode *mind mapping* dapat berdampak terhadap minat belajar peserta didik pada mata pelajaran Peradaban Islam (Tarikh) di Kelas 7. Hasil pembelajaran dengan metode *mind mapping* menunjukkan bahwa hampir semua nilai siswa meningkat dan hal ini berdampak pada perubahan nilai rata-rata di setiap kelas. Antusiasme peserta didik juga terlihat saat mereka mengerjakan *mind mapping* dengan sungguh-sungguh. Namun model pembelajaran dengan *mind mapping* ini terdapat beberapa kekurangan yaitu bagi siswa yang kurang berminat akan sulit memahami materi dengan cepat.

**Kata Kunci:** Pembelajaran Berbasis Otak, Peta Konsep, Covid-19

### **INTRODUCTION**

The ability to think and speak is the main difference between humans and animals (Kohar, 2021). Man was created by being equipped with a reason as a tool to cultivate and think about the knowledge he has gained. Psychologically, the essence of education is the optimization of the entire human potential. The entire human potential resides in his brain. Critical thinking is an essential ability for life and work and has a practical function in all other aspects of life, especially in Learning. Critical thinking is a central goal in education and is often a topic of discussion in research. Several experts provide explanations related to critical thinking. According to Ennis Williawati in Sri Sholihah's writing, critical thinking is reasoned and reflective by emphasizing decision-making about what to believe or do (Solihah, 2019).

A learning method is needed to stimulate their brains to work optimally To build critical thinking in students. Brain empowerment in cutting-edge Learning is used with the Brain-Based Learning method. This method offers the concept of empowering the student's brain through Learning. According to Jansen, there are three concepts of implementing the Brain-Based Learning method in his delivery: Creating a learning environment that challenges students' thinking abilities, namely teachers delivering learning materials to their students must be able to be as attractive as possible from the introduction



of the material to the evaluation stage. Creating a pleasant learning environment by avoiding situations that make students uncomfortable and unhappy in Learning. And create an active and memorable learning situation for students (active Learning). Students as learners are stimulated through learning activities to build their knowledge through an active learning process that they do themselves. (Pt. K Laksmi, I Wayan Sujana, 2014).

This Brain-Based Learning method will balance how the student's brain works. Because it is not only relying on the left brain but also on the right brain. So cognitive intelligence, as well as psychomotor effectiveness, can go hand in hand. Because this Brain-Based Learning Method approach synergizes the workings of the brain, right hemisphere, left hemisphere, and learning styles, multiple intelligence, remembering (how to memorize), emotional brain, reducing stress and the expectations of lecturers or teachers (teacher expectations) (Sang Gede Angga Wiguna, I Wayan Widiana, 2016). Similarly, Gagne explained that a particular situation might motivate one individual because of prior Learning, experience, or expectations (Robert M. Gagne, Walter W. Wager, 2005).

Nowadays, during the COVID-19 pandemic crisis, the learning process cannot be done directly. It hinders students' thinking process; the material is not delivered directly, and the teacher is only limited to giving assignments. From here, the problem of decreasing enthusiasm for learning students is due to saturation in the learning process. Therefore, teachers need to try a learning approach with the Brain-Based Learning method even though it is carried out indirectly or with limited Learning.

One of the brain-based learning models of Brain-Based Learning is the mind-mapping model. Mind Mapping is one of the learning methods developed by Tony Buzan around the 1970s by basing on his research on how the brain works by writing or noting the main topic in the middle and writing sub-topics, and the details are placed around the main topic. This map-recording technique was later developed as a learning method based on how the brain processes information (Karim, 2013, 2017; Sitti Suhada, Karim R. Bahu, 2019).

From the explanation above, a common thread of research problems can be drawn, namely the decline in student interest in learning during the COVID-19 pandemic resulting in a decrease in the educational process so that teachers

must be able to make breakthroughs, one of which is by implementing mind-mapping methods in Learning. In the Tarikh (History of Islamic Civilization), a mind-mapping approach can increase students' interest in Learning. The increased enthusiasm and value evidence before and after using mind mapping.

## **METHODS**

This qualitative research examines brain-based learning management with a mind-mapping model in the learning process of the Covid-19 pandemic era. Data collection techniques through observation, in-depth interviews, and documentation studies (Sugiyono, 2011). For data validation techniques, researchers use triangulation methods and methods. Source triangulation, i.e., the use of different sources to collect similar data; For example, in this study, researchers conducted interviews with students of different classes.

While the triangulation method uses different data collection methods to obtain data. For example, in this study, the results of interview data and the learning process with mind mapping were checked with student learning outcomes before and after using mind mapping. The data analysis method used in this study uses qualitative analysis description techniques. The researcher describes the situation or phenomenon obtained and then analyzes it in sentences to obtain conclusions. This research uses qualitative data analysis from Miles and Huberman (1992), namely data collection, data reduction, data presentation, and drawing conclusions or data verification.

## **FINDINGS**

### **The Role of the Brain and Memory in Learning**

We know that the role of the brain and its function in education is very influential in learning success. Because the benchmark for assessing success in education can be seen from intelligence, and intelligence can be measured from the extent to which memory in the brain can absorb optimally. Humans are perfect creatures equipped with brains to think and understand the knowledge they receive, which is the striking difference between humans and animals (Kohar, 2021). Therefore, the potential for memory must be honed as well as possible through Learning that attracts interest from students.

Memory or the power of memory is significant for human life because it is the power of the human soul to receive, store, process, and produce



impressions, understandings, or responses. Human memory can be consciously controlled, processed, and processed automatically (Muzdalifah, 2019). The science that studies related to brain growth and development is called Neuroscience. According to Taufik Pasiak in Ririn Muzdalifah's writing, Neuroscience is etymologically a neural science that studies the nervous system, especially studying neurons or nerve cells with a multidisciplinary approach (Muzdalifah, 2019).

This role of the brain and memory is significant in Learning because it is related to the evaluation of Learning. Assessment in learning evaluation is indispensable to see success in the learning process in the classroom. Assessment of learning outcomes is contained in Government Regulation 19 of 2005 concerning National Education Standards, which explains assessment standards. Assessment, according to Widiana, is the activity of interpreting or describing the results of measurements. Assessment is a process carried out to measure the achievement of student competencies on an ongoing basis in the learning process, to monitor the progress and improvement of student learning outcomes (Cole et al., 2010; I Wayan Widiana, Gede Wira Bayu, 2017; Ni Wayan Apriani Purwaningsih, I Komang Werdhiana, n.d.; Sang Gede Angga Wiguna, I Wayan Widiana, 2016).

In medical science, our brain is a vital part of the body, a particular organ in carrying out its duties, where the processes of thinking, language, consciousness, emotions, and personality are regulated (Hamonangan, 2020; Saifurrahman, 2019). So important is the brain that he is placed in the best-protected position. The brain is an organ of the human body whose position God honorably places on the upper part of the body and is firmly protected inside the head's skull. The matter of reason or *Al-'Aql* in the Qur'ân is mentioned about 49 times in 28 surahs, i.e., 31 times in the 19 surahs handed down in Makkah and 18 times in the nine surahs handed down in Medina.

In the opinion of Yûsuf al Qardlâwî, the mention of the word *Al-'Aql* in the form of *istifhâm inkârî* (rhetorical question), such as *afalâ ta'qilûn* is a striking thing of the Qur'ân. It happens because the Qur'ân intends to attract man's attention and aims to motivate, encourage, and encourage man to use his intellect. (Purwanti, 2016) It is in line with the Word of Allah Almighty Surah Al-Anfal verse 22 that as bad as a human being on the side of Allah is a person who does not want to hear, speak, and understand the truth. The advantage of

humans with animals, and plants, lies in the functioning or not of the brain to think (Yusuf Qardhawi, 1998).

Therefore, the role of the brain and memory in Learning is vital. Because as a tool to record all learning materials and as a means for assessment in Learning, the most important thing is to think. One of the benchmarks for teachers' success in delivering Learning is when students can understand and carry out evaluations as well as possible. Students to be able to follow the evaluation as well as possible. Of course, the role of the brain is significant as a means of thinking and memory that records the entire learning material.

Learning the history of Islamic civilization prioritizes the aspect of memory; namely, the brain must be able to remember events in the past because this subject is related to Islamic history. At SMP Muhammadiyah 1 Prambanan, especially for grade 7, this subject is considered by students to be saturated. It is evident from the results of observations made by researchers and a confession from one of the grade 7 students that "you have to read a lot, so you often get bored and have a lot to remember" (Rofi Nurjanah, 2021). From this fact, the teacher of the History of Islamic Civilization subject must be able to present fun learning so that boredom and boredom turn into enthusiasm of the students in Learning.

### **Application of Brain-Based Learning Approach Method in The History of Islamic Civilization Grade 7 Subjects at SMP Muhammadiyah 1 Prambanan**

Learning using the Brain-Based Learning model is synchronized with the workings of the brain designed naturally for Learning. In line with this, Syafa'at revealed that Brain-Based Learning offers a concept of creating Learning oriented towards empowering students' brain potential. In applying the Brain-Based Learning learning model approach, several things must be considered because it will significantly affect the learning process, namely the environment, movement and sports, music, games, mind maps, and teacher performances (Yulvinamaesari, 2014).

Given stated that the Brain-Based Learning Approach is a learning concept that utilizes a unified five natural brain learning systems, namely emotional, social, cognition, physical and reflective, and provides a balanced portion of the use of the five learning systems without favoring one of the



systems (Prayogi & Widodo, 2017; Widodo, 2018). From this definition, we can understand that the Brain-Based Learning learning model has a function and purpose to balance the five systems in humans. The system includes several aspects that, if it can be aligned, then the potential of the brain will work much better.

Pasiak expressed that the limbic system and the amygdala components in the brain play an essential role in regulating emotions. The brain will record events through special circuits in the brain and store them so that when the owner of the brain wants to imagine it or use it, the brain will react like an actual event (Widodo, 2018). Based on this definition, we can understand that the Brain-Based Learning approach is a comprehensive approach or metacognition that aims to optimize how students' brains work on aspects of each student's emotional, social, cognitive, physical, and reflective potential.

Mustiada et al. revealed three strategies in the Brain-Based Learning learning process: creating a fun learning environment. With fun learning, it is hoped that students can better understand the Learning delivered. In addition, meaningful Learning and Learning that provides a lot of hands-on experience and emphasizes how the brain works, like the Brain-Based Learning model, can affect student outcomes (Solihah, 2019; Solihat et al., 2017). As stated in a brain-based learning research result at SMPN 20 Palu, the N-Gain value in the experimental group was 61.71%, while in the control group, it was 50.16%. Thus, a brain-based approach can improve students' understanding of concepts at SMPN 20 Palu (Ni Wayan Apriani Purwaningsih, I Komang Werdhiana, n.d.).

Based on the research and presentation results, learning using the Brain-Based Learning approach model dramatically affects student learning outcomes. Because this method prioritizes students' creativity to explore Learning according to how their brains work, thus, the Brain-Based Learning learning model approach can stimulate brain work more optimally to better influence student learning outcomes.

Learning the History of Islamic Civilization Subjects for Grade 7 at SMP Muhammadiyah 1 Prambanan consists of 3 Basic Competencies (K.D.), including K.D.1 About the struggle of the Prophet Muhammad Saw in the Makkah period, K.D.2 About the Struggle of the Prophet Muhammad SAW in the Medina period, and K.D.3 About caliph Abu Bakr Ash-Shidiq. Of the three essential competencies,

students are expected to be able to understand each of these materials, as evidenced through two-question work on each basic competency. The work on the first question is carried out before they are given the task of making a summary with the mind mapping method. The subsequent question work is carried out after they have studied the material by summarizing it with the mind mapping method.

After they worked on the questions, the students were given the work results. After that, the explanation and understanding of the material began with the students being invited to read and summarize the material using a mind-mapping model. The delivery and work on mind mapping tasks are carried out in two learning meetings. The mind mapping they have made must then be re-read and given questions like a question and answer directly to explore their knowledge related to the material being studied. After it is judged that there is an increase in understanding and knowledge, the second question is given at the third meeting. From doing the second question, it will be seen which ones understand and which ones have not experienced an increase in knowledge related to the material of the History of Islamic Civilization.

In addition to the questions to discover students' interests after the material is delivered, they are asked to give a learning impression. Of the 32 class 7E students who took part in learning with hybrid learning, averagely gave a positive response to Brain-Based Learning with the Mind Mapping model. 21 students stated that it was more accessible to remember the material by mind mapping and felt lighter in memorizing events, years, and figures on events in the history of Islamic civilization. As the result of the following interview, "summarizing in this way (mind mapping) makes it easier to memorize the material and years of events from the time of the Prophet to about Caliph Abu Bakr "(Lukmansyah, 2021).

## **DISCUSSION**

### **Stages, Design, and Results of Brain-Based Learning with the Mind Mapping Method in the History of Islamic Civilization**

Learning with the Brain-Based Learning approach model today is very necessary given that the brain work potential of the students must be maximized to balance the work of the left and right brains, as well as to encourage the



enthusiasm for Learning of the students in this COVID-19 pandemic crisis. This learning model approach certainly requires strategies to be implemented correctly and influences learning outcomes. According to Jansen, it is stated that the stages of learning with the Brain-Based Learning approach include: First, the pre-exposure stage, this stage provides an overview to the brain about the Learning that will only be given before delving further into the Learning to be delivered. The teacher can do brain gym or brain gymnastics moments at this stage before starting Learning. According to Gunawan, brain gym is a series of simple gesture activities to build harmony between limbs, especially the brain, to build self-esteem, learning ability, and togetherness. In the second stage of preparation, in this second stage, teachers are required to build curiosity and create fun learning.

The three stages of initiation and acquisition are the stage of providing learning materials. At this stage, Learning should be given an absolute or direct learning experience, for example, case studies, experiments, visits, and others. The fourth elaboration stage is where students need to think initially from the student results. Fifthly incubation enters the memory. This stage emphasizes the importance of time to rest and the repetition of the Learning that has been carried out. The six stages of verification and checking beliefs are critical because the teacher must check the extent to which the student understands the material that has been studied and whether the student has understood it. The seven stages of celebration and integration, the celebration stage can be involved with emotions where students can express their love for Learning by making this stage more fun, cheerful and exciting (Solihat et al., 2017).

In applying the learning model with mind mapping in the subject of The History of Islamic Civilization grade 7, students are invited to understand the material to be discussed before the Learning is carried out. Oral questions and answers related to the material are carried out to trigger their thoughts and concentration to be interested in the discussion of this material. The beginning of Learning is the decisive stage, so they are interested and enthusiastic. Some students say they are interested in teachers who invite light discussions before starting a lesson. As in the following interview results, "it is happier that before the lesson, the teacher invites questions and answers and explains the material first, don't immediately be told to read the questions yourself or work on them"(Nahdiah, 2021). The interview results show that the opening learning

process dramatically determines the student's learning interest, so there must be an approach to Learning.

The Brain-Based Learning approach can be designed using several learning models, one of which is the mind map learning model or mind mapping. According to Sudjana, the learning method is a medium for teachers/lecturers to establish relationships with students during teaching. The Mind mapping Method or mind a map is one of the learning methods developed by Tony Buzan around the 1970s by basing on the results of his research on how the brain works by writing or noting the main topic in the middle and writing sub-topics and the details are placed around the main topic. This map-recording technique was then developed as a learning method based on how the brain processes information (Karim, 2013).

A mind map is a way of taking creative, practical notes, and it will map our thoughts. Wicoff states that the notes are made from interrelated ideas, with the main topics in the middle and subtopics and details being their branches. It can make students happy and not bored in following lessons to improve learning achievement (Utomo, 2012). According to Buzan, the mind map is the easiest way to put information into the brain and take information out of the brain. A mind map is a way of taking creative, practical notes, and it will map our thoughts. The notes are made from interrelated ideas, with the main topic in the middle and subtopics and details being its branches (Utomo, 2012).

Mind mapping is in harmony with the natural way of working the brain because mind mapping involves both hemispheres. A person takes notes by involving symbols or images he likes, using colors for branching that indicate a particular meaning, and can involve a person's emotions, pleasures, and creativity in making notes (Utomo, 2012). The following are the instructions or steps to create a mind map put forward by Tony Buzan: (a) Start by writing the main topic in the middle of the paper, (b) Use illustrated images, symbols, and codes on the entire mind map, (c) Choose keywords on each of the developed branches. (d) Each word/image must stand alone on each of its lines/branches, (e) The branches created must be related to the main topic in the middle of the paper. The main branch line is thicker and thinner as it gets further away from the main branch, (f) Create a line/branch that is the same length as the words. (g) Use colorful colors in the mind map of at least three colors, according to taste,



(h) Develop a mind map shape that suits each other's style or creativity, (i) Leave room for the next edition of the theme.

According to Pandley, the stages of learning with the mind mapping method include: (a) The teacher delivers the material and learning objectives about the subject matter to be studied, (b) Students learn concepts about the subject matter learned with the guidance of the teacher. (c) After the student understands the material explained by the teacher, the teacher groups the students into groups according to the adjacent seating. Then students are encouraged to make a mind map of the material studied. (d) To evaluate students' understanding, the teacher appoints several students to present the results of the mind map by taking notes or writing on the board. (e) From the results of the presentation written by the students on the blackboard, the teacher guides the students to make conclusions. (f) The teacher gives practice questions about the material that has been studied to students individually to determine the student's understanding of concepts and academic abilities (Darusman, 2014).

Each learning method or technique certainly has its advantages. The advantages or benefits of using the mind mapping method according to Tony Buzan (Tapantoko, 2011: 6). The Mind Mapping method (mind map) will increase students' memorization and robust learning motivation, as well as students, become more creative (Darusman, 2014). The benefits of learning with the mind mapping method in detail are as follows: (1) Accelerate Learning because it can understand the same concepts as brain work when receiving lessons. (2) Seeing connections between one topic and another that have a connection, (3) Helping brainstorm and honing the brain's ability to work, (4) Helping ideas and ideas flow because not always ideas and ideas can be quickly recorded. (5) See the picture of an idea broadly and essentially to help the brain work optimally and think big about an idea. (6) Simplify the structure of ideas and ideas, (7) Make it easier to remember ideas and ideas, and (8) Increase creativity and innovative power (Syahidah, 2015).

According to Bobbi DePorter & Mike Hernacki (2007: 173), Mind Mapping has several benefits, such as (1) being flexible; (2) being able to focus attention; (3) increasing understanding; and (4) having fun application (Norma Kusmintayu, Sarwiji Suwandi, 2012). From the explanation and information above, the author can conclude that learning methods with a mind-mapping

approach or mind map can stimulate the brain to optimize thinking power between the left and right brains. And can provide excitatory creativity to students in Learning. With this method, students can easily remember the material they have to learn and put a mark on the memory of the material they are studying.

According to Zaini et al. (2008), it is stated that the advantages of using the Mind Map in Learning include techniques that can be used to organize ideas that arise in the mind. The process of describing diagrams can bring up other ideas. Diagrams that have been formed can be a guide for writing. The mind map has the potential to help improve abilities and allow for reflection and remembering. However, there is a drawback: not all students feel it. Because only active students are involved, and the student's mind map usually varies, teachers will have difficulty checking it (Sitti Suhada, Karim R. Bahu, 2019).

From this explanation, it can be concluded that the mind map method. However, although it has benefits, there are also disadvantages, including the effect of this method cannot be felt by all students, meaning that only active and creative students can feel the effects of this method because this method requires activeness from the student.

Applying the mind mapping model in Tarikh learning for Grade 7 is significantly influential. This influence can be seen from the enthusiasm of the students in creating mind-mapping strokes in their books, as well as the influence which can be seen from the results of working on the questions before and after studying the material by summarizing it with a mind-mapping model. The results of the work on the questions are as follows:

**Table 1.**  
**List of Average Values for the History of Islamic Civilization Map per Class**

NO	Class	Average Value (Learning Mind Mapping)	
		Before	After
1	7A	65	81
2	7B	55	84
3	7C	67	79
4	7D	58	77
5	7E	65	85
6	7F	63	76



The average score table above shows us that the average score of the Islamic Civilization History subject in grade 7 of SMP Muhamamdiyah 1 Prambanan has increased after learning with a mind mapping model. Therefore, a conclusion can be drawn that brain-based Learning with a mind-mapping model can have a significant influence in terms of academic results and also in terms of students' enthusiasm for Learning. However, the drawback is that there are still students who are reluctant to do activities to summarize the material with mind mapping because these students are more interested in summarizing in the usual way, namely by writing a lot of notes in their books.

## **CONCLUSION**

From the presentation of the research results, it can be concluded that during the COVID-19 pandemic to the post-COVID-19 pandemic, which has provided many changes related to the learning process, teachers must be able to present Learning that attracts students. This effort can be realized with a brain-based learning approach where students are invited to participate in Learning. Teachers do not just give tasks but stimulate students so their brain roles can be optimal.

At SMP Muhammadiyah 1 Prambanan, this approach has a significant influence. It is proven in the history of Islamic Civilization lessons, which initially seemed to saturate and dull, so packed with learning with a mind mapping model can make them enthusiastic in Learning.

The research carried out is still limited to the practice brain-based methods in one model, namely the mind-mapping learning model. Several other models can open insights to be able to develop research in the future to study other brain-based learning models.

## **ACKNOWLEDGMENTS**

The researcher expressed his gratitude to SMP Muhammadiyah 1 Prambanan, which has allowed researchers to conduct research. Hopefully, this collaboration can continue to be established for the advancement of science.

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