THE EFFECTS OF SINGING ACTIVITIES ON CHILDREN’S MEMORY, LEARNING MOTIVATION, AND CREATIVITY IN AN INDONESIAN KINDERGARTEN FOR PRESCHOOLERS

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ABSTRACT

Objective: This study aims to ensure that singing activities in preschool children can affect children’s memory, motivate them to learn, and enhance creativity. The idea is, when a child sings, the child is in a happy state, so the brain releases the hormones dopamine, serotonin, oxytocin, and endorphins. These hormones are interrelated, for example, when endorphins bind receptors in the central nervous system, dopamine (the hormone of pleasure) is released. These hormones are produced in the hypothalamus and produce the glands that control the hormones in the brain so that one feels satisfied and happy. As a result of the pleasure experienced by the child, the child will be easy to understand the lessons or material given by the teacher, so the child's memory or intelligence will improve. Creativity will also increase as a result of singing activities. Building creativity means sharpening the mind, and it also means increasing the sensitivity of infiltration in the child. The child is sensitive to the tone, melody, rhythm, lyrics, growing a curiosity because of the singing stimulation given.

Method: Method: This study uses a quantitative experimental approach with pre-experimental characteristics of the type One Group PreTest Post-Test Design. Pre-experienced research is a method to find the influence of a treatment on a group with not too many respondents, using one group without a comparative group, with a pre-test, treatment, and post-test sequence, so that the results of the treatment are clear and accurate as compared to before the treatment. The study was conducted at Northern Jakarta Methodist School with a total of 21 children from 5-6 years of age. The research procedure comprises three stages, namely the planning stage, the implementation stage, and the assessment and analysis stage.

Result: As for the calculations (using the Paired Sample T-Test) pre-test and posttest variables memory power, learning motivation, and creativity, the three showed significance values of 0,000 or < 0.05. This indicates that there are differences in pre-test and post-test data on the three variables. It can be said that, singing activity affects the memory, learning motivation, and creativity of the child. N-gain of the three variables equally showed a value of 0.5. Singing activity is said to have an impact on improving the memory, learning motivation, and creativity of children. A child's singing activity can stimulate the brain to absorb information. There is a repetition of the words to the theme song helps the child to remember the given material. Not only that, the kids also looked happy and enthusiastic during the singing activity. Children also participated more actively during the post-test in answering questions and commenting. The

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joy of a child when performing a singing activity also affects his or her creativity. Singing gives a child positive emotions so it keeps the child undepressed and unrestricted, making the child confident especially in presenting ideas according to his imagination.

**Conclusion:** Based on the results of this study, it can be concluded that singing activity affects the memory, learning motivation, and creativity of children in Methodist kindergarten. This is due to differences in pre-test and post-test results that show an average increase of n-gain 0.5 (moderate increase) on each variable. Singing activity can be said to be an influential learning strategy in improving children's memory, learning motivation, and creativity.

**Keyword:** memory, learning motivation, creativity, singing activity.

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**OS EFEITOS DAS ATIVIDADES DE CANTO NA MEMÓRIA DAS CRIANÇAS, NA MOTIVAÇÃO DO APRENDIZADO E NA CRIATIVIDADE EM UM JARDIM DE INFÂNCIA INDONÉSIO PARA PRÉ-ESCOLARES**

**RESUMO**

**Objetivo:** Este estudo visa garantir que as atividades de canto em crianças pré-escolares possam afetar a memória das crianças, motivá-las a aprender e aumentar a criatividade. A ideia é, quando uma criança canta, ela está num estado feliz, então o cérebro libera os hormônios dopamina, serotonina, ocitocina e endorfinas. Esses hormônios estão inter-relacionados, por exemplo, quando as endorfinas se ligam a receptores no sistema nervoso central, a dopamina (o hormônio do prazer) é liberada. Esses hormônios são produzidos no hipotálamo e produzem as glândulas que controlam os hormônios no cérebro para que se sintam satisfeitos e felizes. Como resultado do prazer experimentado pela criança, a criança será fácil de entender as lições ou material dado pelo professor, de modo que a memória ou inteligência da criança irá melhorar. A criatividade também aumentará como resultado das atividades de canto. Construir criatividade significa afiar a mente, e também significa aumentar a sensibilidade da infiltração na criança. A criança é sensível ao tom, melodia, ritmo, letra, crescendo uma curiosidade por causa da estimulação do canto.

**Método:** Método: Este estudo utiliza uma abordagem experimental quantitativa com características pré-experimentais do tipo Um Grupo Pré-Test Design Pós-Teste. Pesquisa pré-experiência é um método para encontrar a influência de um tratamento em um grupo com muitos entrevistados, usando um grupo sem um grupo comparativo, com um pré-teste, tratamento e sequência de pós-teste, de modo que os resultados do tratamento são claros e precisos em comparação com antes do tratamento. O estudo foi conduzido na Escola Metodista do Norte de Jacarta com um total de 21 crianças de 5 a 6 anos de idade. O procedimento de investigação compreende três fases, nomeadamente a fase de planeamento, a fase de implementação e a fase de avaliação e análise.

**Resultado:** Quanto aos cálculos (usando o Teste T de Amostra Emparelhada), variáveis pré-teste e pós-teste, poder de memória, motivação de aprendizagem e criatividade, os três apresentaram valores de significância de 0.000 ou < 0.05. Isso indica que há diferenças nos dados pré e pós-teste nas três variáveis. Pode-se dizer que, a atividade de canto afeta a memória, motivação de aprendizagem e criatividade da criança. O N-ganhos das três variáveis mostrou igualmente um valor de 0.5. A atividade de canto é dita ter um impacto na melhoria da memória, motivação de aprendizagem e criatividade das crianças. A atividade de canto de uma criança pode estimular o cérebro a absorver informação. Há uma repetição das palavras para a música tema ajuda a criança a lembrar o material dado. Não apenas isso, as crianças também pareciam felizes e entusiasmadas durante a atividade de canto. As crianças também
participaram mais ativamente durante o pós-teste em responder a perguntas e comentários. A alegria de uma criança ao realizar uma atividade de canto também afeta sua criatividade. Cantar dá a uma criança emoções positivas para que ele mantenha a criança sem depressão e sem restrições, tornando a criança confiante especialmente em apresentar ideias de acordo com sua imaginação.

**Conclusão:** Com base nos resultados deste estudo, pode-se concluir que a atividade de canto afeta a memória, motivação de aprendizagem e criatividade das crianças no jardim de infância metodista. Isto é devido a diferenças nos resultados pré-teste e pós-teste que mostram um aumento médio de n-ganho de 0,5 (aumento moderado) em cada variável. A atividade de canto pode ser considerada uma estratégia de aprendizagem influente para melhorar a memória das crianças, motivação de aprendizagem e criatividade.

**Palavras-chave:** memória, motivação de aprendizagem, criatividade, atividade de canto.

1 **INTRODUCTION**

Early Childhood Education (PAUD) is an effort to foster children from birth to age 6 through the provision of educational stimuli to help children's physical and spiritual growth and development be ready to enter the next level (Ariyanti, 2016). As an early level of education, it is undeniable that the learning provided in ECCE has an important role in shaping children's cognitive and affective development. One of the important cognitive aspects to improve is memory ability, while in the affective realm there is learning motivation that needs to be improved to help the child's learning process at school. Not only that, there is creativity, which also includes cognitive aspects that need to be developed, which also helps the child's affective realm in interacting with others.

Memory is a cognitive ability that is trained in such a way that what is seen or heard can be stored in memory and can be reused if needed (Mones, 2020). Good memory of learning materials can improve children's abilities in the academic field (Maulidiyah, 2020). A trained memory can help with long-term memory development.

Learning motivation is an encouragement to carry out certain activities that come from inside and outside the individual so as to foster enthusiasm in learning (Andriani & Rasto, 2019). Children who have high learning motivation show improved learning outcomes, high creativity, active participation, and perseverance in doing tasks (Fitriyani et al., 2020). Learning motivation gives children the enthusiasm to gain knowledge to achieve learning goals, so that it can help academic achievement.

Creativity is a combination of cognitive processes and subconscious elements that produce a new idea, commonly known as "thinking freely" (Fakhriyani, 2016). High creativity can develop children's potential or talents in various fields (Haerazi et al.,
2020). Children can use their creativity to make crafts, do assignments, communicate, tell stories, or interact with others.

However, based on interviews with four teachers at TK Olifant Yogyakarta, teachers observed that during online learning, 30% of 53 children in one grade level and 40% of 48 children in different grade levels had poor memory conditions due to not repeating learning materials at home. It was also found that 12% of 53 children in one grade level and 5% of 48 children in different grade levels also experienced burnout, so their learning motivation decreased. Teachers notice that if students are given material that they think is less interesting, they will be less motivated to learn. The teacher also found that between the two grade levels, 30% and 60% of children experienced obstacles to creative thinking. Teachers argue that their creativity does not increase (monotonous) because of a lack of encouragement from parents, and a trigger is needed so that children can think freely.

This triggers researchers to determine learning strategies that can improve these three aspects. One of the learning strategies that can be used in ECCE is singing. Singing is a teaching method through the use of songs that are in accordance with the material (Hermawati & Suyadi, 2020). Singing is the activity of chanting notes regularly accompanied by movements and musical accompaniment (Hayati et al., 2019). Singing activities provide a place for children to express themselves, speak, hum, and even move, so as to make them active in learning in class.

Singing activities were offered to kindergarten-B students at the school. This study aims to determine the effect of singing activities on memory, learning motivation, and creativity in children, especially to improve these three variables. The hypotheses of this study are as follows: Singing activities have benefits for the learning process, especially in early childhood. According to a previous study by (Ginting, 2019) entitled "Improving Memory Through Singing Method of Children Ages 5-6 Years in Kindergarten Insan Pandhega", singing can improve children's memory skills. When the teacher teaches a song related to the material to the child to be sung repeatedly, the repetition of the melody and verse of the song will be stored in memory.

According to previous research by (Suryani et al., 2019) entitled "The Influence of Singing Method on Learning Motivation of Group B of Immanuel II Christian Kindergarten Sungai Raya", singing activities can provide joy for children so as to increase their learning motivation. The activity of singing melodies gives an interesting
nuance to the learning process, which generally only contains the presentation of material, so that it can encourage children.

Not only that, according to previous research by (Rahayu et al., 2021) entitled "Increasing Early Childhood Creativity through Learning Motion and Song", it was found that singing has benefits for increasing children's creativity. When children sing a song, they can use cognitive processes and their subconscious to imagine the content of the song so that it can trigger an idea or interpretation, especially of songs related to learning material.

Based on the three previous studies, it can be said that, singing activities can optimize memory, learning motivation, and creativity in children. However, from the results of interviews with the four teachers, it was found that singing activities were rarely carried out during the online learning process. This is due to the limited time in online learning that focuses on delivering material. So, researchers are interested in conducting experimental research with the one-group pre-test post-test method entitled "The Effect of Singing Activities on Memory, Learning Motivation, and Creativity of Children in Olifant Kindergarten Yogyakarta Indonesia". The subjects of the study were children's memories at Olifant Kindergarten Yogyakarta. This study aims to determine the effect of singing activities on memory, learning motivation, and creativity in children, especially to improve these three variables. The hypotheses of this study are as follows:

1. Singing activities affect children's memory in Methodist kindergarten.

2 THEORETICAL FRAMEWORK
2.1 DEVELOPMENT OF KINDERGARTEN-B CHILDREN (5-6 YEARS)

The fastest early development occurs when children reach the age of 5-6 years (Kamtini & Sitompul, 2019). The existence of rapid development makes this age range important to optimize children's cognitive and emotional development.

Cognitive development in children aged 5-6 years can be seen through information processing theory, where children are able to absorb information through the five senses, hold it in short-term memory, and store it in long-term memory. This is related
to memory ability. Memory development at this age occurs in the short-term memory section, where the child can already remember two-digit numbers and simple words, as well as in the long-term memory section, where they can remember repetitive activities and memorable events. The existence of memorable events helps children absorb knowledge and integrate it with new information that they will get later in life as they age and gain experience.

The affective aspect of children aged 5-6 years can be seen from psychosocial development, where children begin to be able to represent themselves from various aspects that they master and are interested in, commonly known as representation mapping. Children's interests and preferences are related to their motivation to learn. The development of children's learning motivation is based on things that attract their attention and raise a great sense of curiosity (Nisa & Sujarwo, 2021). The existence of interesting things and giving positive emotions to children in the learning process can motivate children to learn so as to help their academic achievement in school.

In addition, there is children's creativity, which is included in cognitive and affective aspects. Children's creativity is related to their imaginative thinking skills (Umah & Rakimahwati, 2021). According to Piaget's theory, children aged 5-6 years begin to imitate the behavior they see, and children often use their imagination to role-play. Children can be given the opportunity to use their imagination and express it in many ways, whether through stories, crafts, ideas, or music games that can foster their creativity.

Based on all the theories about child development that have been described above, it can be concluded that the age range of 5-6 years is the peak point at the early age level which is very important to optimize their memory skills, learning motivation at school, and creativity in using their imagination.

2.2 MEMORY

Memory is a cognitive ability that is trained in such a way that what is seen or heard can be stored in memory and can be reused if needed (Mones, 2020). Memory is the ability to retrieve information or experiences stored in the brain. Memory can also be defined as a mental process that operates in the brain, including the stages of coding, storing, and retrieving information obtained (Anggriyani, 2021).
Based on the three views above, it can be said that memory is an ability in the brain through the process of receiving and storing information and experiences obtained, and retrieving the information if needed in the future. The memory storage process is divided into 3 stages, namely:

1. Encoding: the process of entering information through the five senses.
2. Storage: the process of storing information in memory.
3. Retrieval: the process of retrieving information from memory.

The stored information goes through three stages of memory, that is:

1. Sensory Memory: the first part of the memory captured by the five senses for 0.5 – 3.0 seconds.
2. Short Term Memory: the part of the memory that works based on information that persists in sensory memory, information that persists for 15 – 30 seconds.
3. Long-Term Memory: the last part of the memory that is able to retain information for a long time and can be used again in the future (Aini, 2019).

Good memory is demonstrated through information that persists in long-term memory because the information can be useful in the future. According to (Nyoman & Prawita, 2023), there are two factors that affect memory, namely:

1. Internal factors: factors based on intelligence, motivation, physicality, learning modalities, and disorders related to mixed information.
2. External Factors: factors are based on the physical and social environment. The physical environment refers to classroom situations and conditions, while the social environment refers to teacher and student interactions as well as interactions among students during the learning process.

The singing activities carried out in this study are included among external factors related to the classroom atmosphere and teacher interaction with students. According to Ferbrianto, (2018), there are four indicators of good memory, namely:

1. Able to concentrate during lessons.
2. Able to explain the content of the material.
3. Able to tell stories according to what is remembered.
4. Able to respond to the material provided.

Another researcher, Mones, (2020) suggests that indicators of memory ability are:

Able to mention it back and can show back. Good memory has the following indicators, such as being able to answer questions correctly and having the ability to memorize
materials (Anggriyani, 2021). Based on the above opinion, the researcher chose four memory indicators to be measured for this study, namely:

1. Able to concentrate during lessons.
2. Able to explain the content of the material.
3. Able to mention it back.
4. Able to respond to the material provided.

2.3 LEARNING MOTIVATION

Learning motivation is a strong drive that directs students to achieve learning goals based on each learning activity they participate in (Wardani et al., 2020). Learning motivation is the key to success in learning by honing students’ internal abilities to achieve learning goals (Saptono et al., 2020). Learning motivation can also be defined as the drive to do certain activities that come from inside and outside the individual so as to foster enthusiasm for learning (Andriani & Rasto, 2019).

Based on the opinion above, it can be said that learning motivation is a trigger from inside and outside students to try and participate in learning activities to achieve learning goals. Motivation is based on the existence of needs that must be met. Maslow (Uno, 2016) put forward a theory of needs, where humans have hierarchical needs that must be met as a basis for motivation, ranging from physiological needs, security, affection, respect, and self-actualization. McClelland (Rybnicek et al., 2019) proposed a theory of motivation based on the need for achievement, power, and social relations. (Acquah et al., 2021) proposed the theory of motivation, Existence, Relatedness, and Growth (ERG), where motivation is based on the need for self-existence, relationships with others, and self-growth or development.

The need to get education, knowledge, and achievement is the basis for learning motivation in each student to reach the stage of actualization or self-development. The learning motivation is divided into two types:

1. Intrinsic Motivation: motivation that comes from within the individual, where students can be driven by themselves to learn according to their wishes, interests, and goals.
2. Extrinsic Motivation: motivation that comes from external stimuli, such as teachers, parents, friends, or activities in the classroom, can provide enthusiasm for learning (Wardani et al., 2020).
According to Giri, (2021), there are six factors that affect children's learning motivation: goals, learning ability, physical and spiritual conditions, classroom environmental conditions, dynamic elements in learning, and teacher efforts in providing learning strategies. Singing activities carried out in this study are included in extrinsic motivation that can provide enthusiasm for learning in children, and are included in the teacher's efforts to provide learning strategies that can increase children's learning motivation.

Umam, (2019), argues that children who are motivated to learn have the characteristics of:

1. Able to show courage in telling difficulties in learning.
2. Able to actively participate.
3. Able to complete tasks to completion.
4. Able to show passion in learning.
5. Able to learn independently.

According (Keat & Jia, 2023), the characteristics of good learning motivation are:

1. Able to show interest and attention to the material studied.
2. Enthusiasm for doing tasks.
3. Responsible for working on tasks to completion.
4. Show a sense of pleasure when participating in learning.
5. Provide reactions or responses to the material taught by the teacher.

Other researchers, Suryani, Meiring, and Yuniarni, (2019), argue that the characteristics of good children's learning motivation are:

1. Show concern when the teacher teaches.
2. Enthusiastic about participating in learning.
3. Do not procrastinate on tasks.
4. Do tasks carelessly.
5. Work on tasks independently.
6. Active in answering teacher questions.

Based on the characteristics above, the researcher chose 5 indicators of learning motivation to be measured for this study, namely:

1. Able to show courage in telling difficulties in learning.
2. Show a sense of pleasure when participating in learning.
3. Provide reactions or responses to the material taught by the teacher.
4. Enthusiastic about participating in learning.
5. Active in answering teacher questions.

2.4 CREATIVITY

Creativity is a combination of cognitive processes and elements of the subconscious that produces a new idea, commonly known as "thinking freely". Creativity is the mental ability or energy in the mind that is able to produce innovative ideas or works (Putri et al., 2019). Creativity can also be defined as the ability to give birth to new ideas in the form of innovation or the development of previous works based on intelligence and the results of human hard work.

Based on the opinion above, it can be said that creativity is a mental ability that is able to produce new ideas or, works, or their development based on intelligence and freedom of thought. Early childhood creativity can be seen from the point of view of the theories of behaviorism and psychoanalysis.

Based on the theory of behaviorism, creativity develops due to the influence of the surrounding environment (Ledang, 2020). The experience of individual interaction with the environment can provide examples for behaving creatively. This is especially appropriate for early childhood, where children still need stimulus from teachers so that they can respond to improvements in learning.

The view of psychoanalysis indicates that creativity has come from the human subconscious since childhood. It is also related to the imaginative mind of the child. Subconscious impulses can give rise to freedom in thinking as we age. The existence of an imaginative subconscious mind in children can be stimulated through activities that attract children's attention, such as singing activities.

According to Ramdini & Mayar (2019), factors that affect children's creativity are personality, a conducive environment, the role of teachers in providing creative teaching, and parental assistance. The role of teachers in providing learning strategies is one of the factors in increasing children's creativity. Thus, this study focused on the teaching factors provided by teachers through singing activities.

Rhodes (Wu et al., 2020) proposed four types of creativity given the term 4P, namely:

1. Person: creativity that every individual already has both mentally and physically.
2. Process: creativity is formed due to the thinking process or learning process.
3. Press: creativity supported by a conducive environment.
4. Product: creativity realized through real work or a product.

Creativity can develop through the learning process and a conducive environment that open up opportunities to produce concrete works. In this study, the type of creativity focused on a conducive learning process and environment through learning strategies and singing activities.

Based on opinion (Putri et al., 2019) there are five characteristics of creativity; dare to ask, be open to new and unusual ideas, can connect different things freely, able to imagine something to produce something new, listening to intuition.

According to other researchers, Yeye (2023), the characteristics of creativity are: have great curiosity, capable of having a high imagination, feel challenged by differences, dare to take risks, respect others.

This is supported by the statement (Ramdini & Mayar, 2019), argues that the characteristics of good creativity are:
1. Happy to seek new experiences.
2. Enjoy working on difficult tasks.
3. Happy to seek new experiences.
4. Enjoy doing tasks.
5. High initiative.
6. Able to think critically about the opinions of others.
7. Dare to express opinions.
8. Have a high sense of curiosity.
9. Be sensitive to your surroundings.
10. Vigorous and tenacious.
11. Likes diverse tasks.

Based on the characteristics above, the researcher chose five indicators of creativity to be measured for this study, namely:
1. Have great curiosity.
2. Capable of having a high imagination.
3. Dare to express opinions.
4. Sensitive to surroundings.
2.5 SINGING ACTIVITIES

Singing is the activity of making pitched and rhythmic sounds, either accompanied by music or without musical accompaniment. Singing is the activity of singing notes regularly accompanied by movements and musical accompaniment (Hayati et al., 2019). Singing can also be defined as the activity of producing sounds using words to express thoughts and feelings (Mardiah & Ismet, 2021).

Based on the above view, it can be said that singing is the activity of producing pitched and rhythmic sounds with words, musical accompaniment, or without musical accompaniment as a means to express thoughts and feelings. Singing can be one of the learning strategies, especially at the ECCE level. According to Hermawati & Suyadi, (2020), singing activities are a teaching method or strategy through the use of songs that are in accordance with the material.

Singing activities carried out by children are related to the repetition of the songs they hear. Early childhood tends to imitate other people's words, as Piaget said, as a repetitive reaction (Deiniatur, 2017). When singing, the child revocalizes the song he hears. When teaching songs, teachers sing them sentence by sentence so that children can easily follow along.

Singing activities have benefits for children's memory skills. Kamtini & Sitompul (2019) said that singing can make children pay attention to the lyrics of the song being sung so that the repetition of words helps the development of short-term memory. Singing activities also give a pleasant impression for children so that they can stimulate emotions and thoughts to focus on learning (Ginting, 2019). Memorable mood is associated with episodic memory, it can help children recall things in their long-term memory.

Singing activities are also beneficial for children's learning motivation. According to (Suryani et al., 2019), singing makes it easier for children to absorb material and gives them a feeling of joy. Difficult material can be conveyed interestingly through songs so as to help children learn the material. Interesting triggers in learning can foster children's interest so as to encourage the learning process (Wardani et al., 2020).

Not only that, singing activities are beneficial for children's creativity. Singing can activate a child's imagination so that it triggers him to think creatively (Rahayu et al., 2021). Singing helps children express their emotions actively, thus helping them come up with creative ideas. The emotional aspect in songs also affects creativity. Positive
emotions can make children feel less depressed, unrestricted, and comfortable so as to provide cognitive flexibility for children in creative thinking (Daher et al., 2021).

Based on the theory above, it can be said that singing activities are beneficial for improving memory, learning motivation, and creativity. Choosing songs in the ECCE learning process requires the following requirements (Anggriyani, 2021):

1. Psychological aspect: songs contain things that are in accordance with the children's psyche.
2. Physical aspect: songs are in accordance with the ability of the child's physical organs to sing.
3. Sociological aspect: the theme of the song is still within the scope of learning in schools and children's environments.
4. Pedagogical aspect: songs can help children's development in aspects of intelligence, skills, and behavior.
5. Didactic aspect: the song should have a simple melody, short intervals, and a medium rhythm.

Based on these requirements, researchers used children's songs by Djito Kasilo in accordance with the sub-themes of learning at the time of the study, namely "Hygiene" and "Safety". The songs chosen were "Gosok Gigi" and "Jaga Jarak".

The steps for carrying out singing activities in the learning process are as follows.
2. Implementation Process: The teacher explains the material taught, sets an example by singing the song, and teaches the song.
3. Assessment Process: The teacher observes the extent of the children's mastery of songs and how they respond after singing activities.

It can be concluded that singing activities should be carried out systematically in the learning process, accompanied by teacher monitoring of children's development after doing these activities.
3 METHODOLOGY

This study used a quantitative experimental approach with pre-experimental characteristics of the One-Group Pre-Test -Post-Test design type. Pre-experimental research is a method to look for the effect of a treatment on a group with not too many respondents (Arifin, 2020). According to (Baharuddin & Hardianto, 2019), the type of One-Group Pre-Test -Post-Test design is a pre-experimental study with 1 group without a comparison group, with the order of pretest, treatment, and post-test, so that the results of the treatment become clear and accurate because they are compared to before treatment.

This research was conducted at Olifant Kindergarten Yogyakarta, follows:

Planning Stage: The researcher interviewed four teachers of TK Olifant Yogyakarta regarding the research problem and asked the principal for permission to conduct the research. Researchers also made learning plans with homeroom teachers and assistants related to the use of singing activities.

Implementation Stage: The researcher tests the validity and reliability of the rubric instrument, then pre-tests memory, learning motivation, and creativity at the first meeting. At the next meeting, researchers were treated to singing activities for four meetings. After that, at the last meeting, researchers post-tested all three variables.

Assessment and Analysis Stage: The pre-test and post-test data will be tested for normality and homogeneity, after which the results are compared and calculated...
according to the hypothesis test technique used. The calculation results are analyzed, and a report is made to answer the research problem.

Pre-test and post-test are carried out by observation and assessed using rubrics according to the indicators used. The rubric is filled out by three observers (a researcher, a homeroom teacher, and a homeroom assistant) by making observations during learning. There are other data collection techniques by means of documentation, such as viewing videos during online learning, making observations, and filling out rubrics.

4 RESULTS AND DISCUSSION
4.1 RESEARCH FINDINGS

In the research process, there was one student who was absent, so the research subjects became 21 children. As for the results of hypothesis calculations (using the Paired Sample T-Test) for the pre-test and post-test variables of memory, learning motivation, and creativity, all three showed a significance value of 0.000 or < 0.05. This indicates that there are differences in the pre-test and post-test data on the three variables. It can be said that singing activities affect memory, learning motivation, and creativity in children.

The difference in the pre-test and post-test of the three variables showed an average increase. The pre-test and post-test averages of the three variables can be seen in Table 1 below.

Table 1: Results of Pre-Test and Post Test Memory Calculations, Learning Motivation and Creativity

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>Pre-Test</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Memory</td>
<td>66.4</td>
<td>84.1</td>
</tr>
<tr>
<td>2</td>
<td>Learning Motivation</td>
<td>70.7</td>
<td>86.9</td>
</tr>
<tr>
<td>3</td>
<td>Creativity</td>
<td>64.6</td>
<td>83.6</td>
</tr>
</tbody>
</table>

Source: Prepared by Authors (2023)

Researchers also looked for the value of increase (N-gain) from the pre-test and post-test data of all three variables. The criteria for N-gain are as follows:

Table 2: Calculation Results and N-Gain Criteria

<table>
<thead>
<tr>
<th>No.</th>
<th>Value</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>g &gt; 0.7</td>
<td>Tall</td>
</tr>
<tr>
<td>2</td>
<td>0.3 &lt; g &lt; 0.7</td>
<td>Keep</td>
</tr>
<tr>
<td>3</td>
<td>g &lt; 0.3</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Prepared by Authors (2023)
The N-gain of the three variables equally indicates a value of 0.5. It can be said that all three variables showed moderate improvement between the pre-test and post-test. Singing activities are said to be influential in improving memory, learning motivation, and creativity in children.

During the research process with singing activities, the children were very enthusiastic and focused on online learning. This supports previous research showing that singing activities attract children's attention so as to stimulate their attention (Kamtini & Sitompul, 2019). Singing activities that attract children's attention can stimulate the brain to absorb information (Ginting, 2019). The repetition of words in the theme song helps children remember the material given.

Not only that, but the children also look happy and enthusiastic during singing activities. The influence of singing activities on children's learning motivation supports previous research that shows that singing provides joy and makes it easier for children to understand the material so as to foster their interest in learning (Suryani et al., 2019). Children also participated more actively during the post-test by answering questions and making comments. This is in line with previous research showing that singing activities can foster children's enthusiasm for actively participating in class, such as asking questions out of curiosity and answering questions (Yatimah et al., 2021).

Post-test, children tend to answer questions that are creative according to their own imagination. The stimulation of children's imagination with singing activities is in line with the statement in previous studies that by singing children can use their imagination, which can stimulate children to release creative ideas (Rahayu et al., 2021). The sense of joy children feel when doing singing activities also affects their creativity. The existence of singing activities gives children positive emotions so that they are not depressed or limited, making them confident, especially in expressing ideas according to their imagination (Suasthi et al., 2020).

Based on the discussion of the influence of singing activities on memory, learning motivation, and creativity, it can be said that singing activities that attract attention are related to children's attention in absorbing information, children's joy in learning, and children's freedom in imagining.

Good attention improves children's memory; joy makes children motivated to learn; and freedom of imagination makes children able to express creative ideas. The existence of singing with music and songs optimizes children's cognitive processes in
remembering material and thinking creatively, as well as their affective aspects because of positive emotions that make them excited and interested in learning during class and make them free to imagine.

4.2 DISCUSSION

![Picture 2: The Framework of 21st Century Learning](Source: Prepared by Authors (2023))

4.2.1 Singing Increases Children's Learning Motivation

Singing is one element of creating a cheerful and happy situation. Children will spontaneously sing if they are happy or sad. Singing with simple notation or tone and words that are easy to memorize is very popular with children. Learning will be more effective if you use singing media. The use of this singing method is an effort by teachers to increase activity in the teaching-learning process.

According to Sheppard & Dewanto (2007), when a child is singing, there will be a pleasant process, and there will be an encouragement in the child to learn more deeply. A teacher must be careful in choosing songs so that children are interested in the songs performed and will happily choose to learn them, not based on mere demands. That way, children will automatically be encouraged to learn more about the material that has been given and also produce a feeling of joy when learning it.

The singing method is a teaching method that is done by singing using a melodious voice, a tone that is pleasant to hear, and words that are easy to memorize. When singing, children will relax, not be anxious, and be able to express expressions. The purpose of singing is to cultivate feelings of rhythm and aesthetics, enrich language repertoire, and train memory, and singing provides satisfaction, joy, and happiness for children so as to encourage them to be interested in studying harder. With the implementation of limb and
sensory learning and treatment using the singing method in low-grade children, it turns out that children are more motivated to participate in learning activities.

The use of singing methods can clearly increase the learning motivation of low-grade students. This can be seen from the increase in each indicator of student learning motivation, namely asking questions, answering questions, active participation, and concentration in following learning. The results of the application of singing methods can increase student learning activity in class. This is evidenced by an increase in the percentage of activeness, increasing student learning activity so that learning objectives are achieved.

### 4.2.2 Improvement of Cognitive abilities through Singing Method

In learning activities, the singing method is often used by teachers in early childhood. This is because the singing method has a considerable role in improving children's cognitive abilities. Children who tend to be silent are required to be more active, and children who quickly memorize song lyrics gain more vocabulary. This kind of method is very effective in improving cognitive abilities and making the learning atmosphere cheerful and passionate so that children's memories can be stimulated optimally. Through the singing method, children are more enthusiastic, and their involvement in learning activities is more dominant. In addition, teacher communication with children looks effective and communicative (Kristiana et al., 2021).

This singing method is related to the ability to absorb the content of songs sung by children, which can stimulate creativity and cognitive development in children, but also verbal intelligence and emotional intelligence. Verbal intelligence can be found in the vocabulary contained in the lyrics of songs sung by children, while emotional intelligence is more about children practicing controlling emotions when singing songs. So that the creativity created through singing can foster its own pleasure for children (Dyramoti & Wahyuningsih, 2022). Through singing, the child's learning atmosphere is more fun and exciting; it makes children happy, removes sadness, makes them feel entertained, and makes them more excited. By singing, the potential of the right hemisphere can be optimized so that the messages we give will stay longer in the child's memory (long-term memory), and thus the child will always remember word for word what he received (Ning, 2020).
The joy felt by children can also be expressed in songs; all children like to sing, even if they are shy. Because even though they are embarrassed without realizing it, they have indirectly recognized a new word in the language they are singing. By singing songs that children like, it can provide satisfaction, joy, and happiness for children so as to encourage them to study harder (Anggraini et al., 2019). The words that float, accompanied by musical accompaniment, can inspire their own enthusiasm. In fact, it is not uncommon for the teacher to teach or memorize something by singing. With such lyrics, it can help children's memory and speech (Keat & Jia, 2023).

4.2.3 Results Achieved from the Development of Creativity Through a Musical Approach

Basically, music has a profound and positive effect on a child's mental and physical development. Music can affect the development of children's brain intelligence and increase their creativity. One of the efforts to increase children's creativity is through musical skills. The ability to play a musical instrument, sensitivity to rhythm, and the ability to coordinate movements and sounds in a pleasant way Early childhood needs a lot of opportunities to sing together, learn to sing well, listen to various types of children's songs, and even play music, even if it's just simple music.

One of the roles of early childhood teachers in developing children's creativity is to provide as many opportunities as possible for children to build their hearing by using songs and musical instrument games, arouse their interest in music, begin to shape their musical tastes, and introduce music passed down by previous generations. With music, children can express a sense of fun, joy, and enthusiasm in a learning activity.

Music is a creative activity (Kristiana et al., 2021). A creative child will show curiosity, attitude, and imagination to try. Creativity activities in the field of music aim to strengthen and develop musical knowledge and skills that have been obtained, such as, among others:

1) Practice emotional sense and sensitivity.
2) Teach children mentally to love harmony, beauty, and kindness.
3) Try and choose the appropriate musical instrument to use the content or intent of thoughts or feelings.
4) Improve the ability to hear messages and synchronize motion to the music heard.
5) Improve the ability to hear music or singing by observing the nature, disposition, or characteristics of the main elements of music.

6) Increase sensitivity to the content and message of music or singing to be able to enjoy and appreciate music.

Creative self-expression among children is still simple. For example, the child demonstrates typical movements to describe the song and plays the percussion instrument louder or softer with the intention of adding a certain nuance, perhaps composing or changing a new verse for a familiar song. Music appreciation in kindergarten is closely related to singing, playing musical instruments, and physical movements that can increase children's creativity.

5 CONCLUSION

Early childhood is for those who are in a unique process of growth and development, with specific patterns of fine and gross motor growth and development, intelligence, socioemotional development, language, and communication based on the child's growth and development rate. Improving cognitive abilities in children can be stimulated by various learning methods, one of which is singing. Singing has benefits for early childhood, including the achievement of children's cognitive abilities in developing thinking power and language skills as physical activities carried out by children. The singing method is very effective in improving cognitive abilities and making the learning atmosphere cheerful and passionate (motivation), so that children's memory can be stimulated optimally. With the application of singing methods in early childhood, cognitive abilities, memory, motivation, and creativity increase.

Based on the results of this study, it can be concluded that singing activities affect the memory, learning motivation, and creativity of children in Olifant Kindergarten Yogyakarta. This is due to differences in pre-test and post-test results, which show an average increase with an n-gain of 0.5 (a moderate increase) in each variable. Singing activities can be said to be an influential learning strategy for improving memory, learning motivation, and creativity in children.
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