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The Innovation Breakthrough in Digital and Disruptive Era
Improving Spatial Visual Intelligence in Merauke Kindergarten Group B Children Using Finger Painting Techniques

Cristiana Normalita de Lima¹,*, Dharma Gyta Sari Harahap², Muh. Rafi’y³, Ferry Irawan⁴, Rivaldo Paul Telussa⁵

¹,²,³ Departement of Early Childhood Education Teacher Education, Universitas Musamus, Merauke, Indonesia
⁴ Departement of Elementary School Education Teacher Education, Satya Wiyata Mandala University, Nabire, Indonesia
*Corresponding author. Email: normalita@unmus.ac.id

ABSTRACT
Drawing and painting activities. The finger painting technique is one type of activity that can be done to develop visual-spatial skills. The study included group B children from Merauke District Kindergartens. Classroom Action Research (CAR) was used, and it was carried out in two cycles. Three meetings were conducted in each cycle. This study included 200 students from five kindergartens in the Merauke District, including Pembina State Kindergarten, Yapis Kindergarten, ABBA WASUR II Kindergarten, and AL-FATAH Kindergarten. Techniques for collecting data include direct observation, practice, and documentation. Analyze descriptive data. The study's findings revealed that employing the finger painting technique, children's visual spatial intelligence increased at each meeting, with cycle I reaching 20 children (10%), up to 180 children in cycle II (90%) with the criteria Developing According to Expectations.

Keywords: Increase intelligence, spatial visuals, finger painting.

1. INTRODUCTION
Education is one of the important needs for human life. Thus every person who is in the territory of Indonesia has the right to receive educational services. Education considered this is important because with education the fate of a lagging nation can change into a developed country. Advanced education makes the nation progress. The development of human potential can be processed through educational activities which are usually held by the government or private parties. Education can be said as a life process to develop all the potential that exists in individuals to be able to live and be able to carry out life fully so that they become educated individuals, both cognitively, affectively, and psychomotor. Education is a process of educating humans to become human beings who are useful for the homeland, nation and state. In the process of educating it is not easy, it is not easy to feel the results in an instant, because education is one of the long-term investments that will yield results when educated people can carry out their roles in the future for the progress of the nation, nation and state in the field they are involved in [1]

Spatial visual intelligence is stated by [2] which states that spatial intelligence are capacities to perceive the visual world accurately, to perform transformations and modification upon one's initial perceptions and to be able to re-create aspects of one's visual experience even in the absence of relevant physical stimuli. Gardner in this case explained that spatial visual intelligence is the capacity or ability to perceive the visual world accurately, to form a mental picture of spatial layout or present the world of space internally in his mind and modify something. Spatial visual intelligence helps a person to be able to create from one's visual experience even without stimulation.

This is reinforced by [3] that the ability to perceive the visual-spatial world accurately (e.g., as a hunter, scout, or guide) and to perform transformations upon
those perceptions (e.g., as an interior decorator, architect, artist, or inventor). This intelligence involves sensitivity to color, line, shape, form, space, and the relationships that exist between these elements. It includes the capacity to visualize, to graphically represent visual or spatial ideas, and to orient oneself appropriately in a spatial matrix. The statement explains that a person who is visually savvy has sensitivity to colors, lines, shapes, spaces and buildings and can perceive colors, directions and spaces accurately. A necessary ability in the spatial visual world involves sensitivity to color, line, shape, space, and the relationships that exist between these elements.

Drawing and painting hobbies in early childhood can help to build visual-spatial ability. Finger painting is one type of activity that Merauke Kindergarten students engage in as part of their learning while playing and playing while learning process.

Finger painting is popular. Painting with your fingers is a delightful activity for kids. Painting allows youngsters to express the different imaginations that they have in their heads. The pictures that youngsters create demonstrate their level of creativity, as well as their emotional level, which may be seen in the way and results of the child's drawings. Typically, what is in the child's shadow becomes the focus point in moving the child's little fingers without the child's mind experiencing an objective inaccuracy.

Based on observations in five Merauke District kindergartens, namely Pembina State Kindergarten, Yapis Kindergarten, ABBA WASUR II Kindergarten, and AL-FATAH Kindergarten, with a total of 200 children. In general, they are still unable to perform painting activities correctly. This can be seen in the finger painting activities of 200 children, 50 of whom have not utilized their fingers well, in drawing activities, 50 children are still unable to paint pictures well, and there are 50 children while applying colors on paintings, unable to properly place the color. Spatial visual development can be noticed when children are given drawing/painting exercises with their fingers; most children have not been able to carry out these activities until they are completed on time, even if they are not flawless.

The conditions on the field do not correspond to the objective of learning in kindergarten schools. This was caused by the employment of fewer diverse learning approaches. The classical method is the dominant technique of learning, particularly in kindergarten. Furthermore, the media employed is generally in the form of worksheets, textbooks, and exercises that focus more on academic talents.

Based on the foregoing, the researcher believes there is a need to undertake study on the use of the Finger Painting Technique in developing the spatial Visual Intelligence of group B children at Merauke Kindergarten.

1. METHOD

Classroom Action Research was used in this study. This study aims to promote spatial visual intelligence in group B kindergartens in Merauke using the finger painting approach.

From April to June 2023, this study was carried out in five kindergartens in the Merauke District: Pembina State Kindergarten, Yapis Kindergarten, ABBA WASUR II Kindergarten, and AL-FATAH Kindergarten. There were 200 Kindergarten-aged Merauke Regency children that participated in this study as subjects.

This Classroom Action Research refers to the model. It takes the shape of a cycle and is completed in two cycles, each of which consists of the planning, implementing, observing or observing, and reflecting stages. The stages of classroom action research in each cycle are shown in Figure 1.1 below:

Figure 1. Cycle of Classroom Action Research

The tasks performed at each stage of each cycle are succinctly described here.
1.1. Cycle I

1. Action Planning
   Before entering the action planning stage, initial observations are first carried out to determine the main problems that actually occur and are faced by the teacher during the learning process.

2. Execution of Action
   Implementation of actions in the classroom refers to the Daily Activity Plan that has been prepared beforehand.

3. Observation
   There are three main things that must be observed or observed during the action process.

4. Reflection
   At this stage, contemplation is carried out on the entire process of implementing the action on the results obtained during the action. Reflection activities mainly refer to records and information on the success or failure of the action process provided by the collaborator teacher.

1.2. Cycle II

The results of reflection on the first cycle become a reference in planning the action process in the second cycle. Therefore, all activities carried out by researchers in cycle II are relatively the same as cycle I.

All records of weaknesses and failures in implementing actions in cycle I obtained from collaborator teachers become the center of attention during the process of implementing actions in cycle II so that the learning objectives that have been set can be achieved.

1.3. Data Collection Technique

Regarding some of the methods for gathering research data used in classroom action research, namely:

1. Observation
   With the aid of finger painting, this observation technique hopes to raise the visual-spatial intelligence of Group B students at Merauke Kindergarten. An observation sheet was used in this study to gather data.

2. Live Practice
   Direct Practice is an activity carried out to determine children's visual-spatial abilities in using the finger painting technique.

3. Documentation
   Documentation contains important things that happened during the learning process that can be used to complete data that are not recorded in the observation sheet.

1.4. Data Analysis Technique

Based on assessment criteria used at the Kindergarten level of education, the finger painting proficiency of Merauke Kindergarten Group B students is evaluated as follows:

★ : Simple image shapes do not yet appear clean, neat, and beautiful if the child is 'not yet evolved' in finger painting activities, such as by being unable to choose colors or scribbling on the activity page.

★★ : If the kid has "started to develop" in finger painting activities by selecting a color that complements a straightforward drawing item, even though it is not obvious in appearance and the color selected does not complement the anticipated drawing object.

★★★ : When a kid has "developed according to expectations," they are able to demonstrate cleanliness, tidiness, and beauty as expected even though they are still receiving teacher assistance when finger painting. They have picked the proper colors, clearly constructed simple images, and can display cleanliness, tidiness, and beauty as expected.

★★★★ : If a child's level of development is very high, they will be able to construct basic images, demonstrate cleanliness, orderliness, and beauty in their painting without the aid of a teacher when engaging in finger painting activities.

In determining the level of success of children used the following formula, [8]

\[ P = \frac{F}{N} \times 100\% \]

Information:

F = frequency that is being searched for the percentage
N = Number of cases (amount frequency/total number of individuals)
P = percentage figure
1.5. Success Indicator

This research is said to be successful and will stop if at least (85%) or 170 children out of the total number of children (200 children) have reached three stars, namely the child has developed as expected.

2. RESEARCH RESULT

2.1. Initial Conditions Before Action

Based on the results of initial observations, it can be seen that the learning that took place in group B of Merauke Kindergarten showed that 180 out of 200 children had difficulties and did not understand about finger painting or finger painting, the children had not been able to do it well.

Based on observations, it was found that the spatial visual intelligence of group B children at Merauke Kindergarten was still underdeveloped, especially in carrying out finger painting activities.

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>180</td>
<td>90%</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>20</td>
<td>10%</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Amount</td>
<td></td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

According to the following table, youngsters still have a poor level of spatial visual intelligence during finger painting, evidenced by the 80% majority of youngsters who received good criterion scores but did not meet the required indications.

2.2. Description of Research Results

2.2.1. Cycle I Meeting 1

Action Implementation Stage

The following is data from observations made in cycle 1. At this stage there are children who can paint but color placement, simple image shapes, cleanliness, tidiness and beauty of the paintings are not visible, which can be seen from the following table:

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>160</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>40</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Amount</td>
<td></td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on the table above at the first meeting, it can be said that it has not reached the expected criteria for the visual spatial development of children in using finger painting because 160 children (80%) have not yet developed and 40 children (20%) have started to develop, so the next meeting is held.

Reflection

From the results and processes carried out in Cycle I meeting 1 there were still many students who did not understand and understand well about finger painting activities. Because during the lesson there were children running around and disturbing their friends during the lesson. In addition, children quickly get bored if learning is not interesting.

The results of his research are also supported by previous research, namely [9] Visual-spatial abilities can be stimulated through various programs such as painting, forming something with plasticine, stamping, and composing pieces of images have been clearly seen in Merauke children are still underdeveloped, especially in doing finger painting activities.

As for previous research that explained that the core components of visual-spatial intelligence are sensitivity to lines, colors, shapes, space, balance, shadows, harmony, patterns, and relationships between these elements. Another component is the ability to imagine, present ideas visually and spatially and orientally appropriately [10]

2.2.2. Cycle I Meeting 2

Action Implementation Stage

Observations on the activities of finger painting or finger painting at the second meeting revealed
several things as follows: The results of observations in the first cycle of the second meeting can be seen in the following table below:

Table 3. Observation results of Meeting 2 Cycle I

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>140</td>
<td>70%</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>40</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>20</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Amount</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

According to the aforementioned table, 140 (or 70%) of the children are still not developed, 40 (20%) are start growing, and 20 (10%) have growing as expected, the child has begun to show an increase in development from meeting 1 to meeting 2 but not yet. successful since 150 children met the expected levels of visual-spatial development and the study's eligibility requirements did not fulfill the conditions of 80%..

Reflection

From the results and processes carried out in Cycle I meeting 2 there were still many children who did not understand and understand well about finger painting activities. Because when learning takes place there are children who tend to get bored quickly and play doodles with friends during learning. In addition, children quickly get bored if learning is not interesting.

2.2.3. Cycle I Meeting 3

Action Implementation Stage

Observations on finger painting activities can be seen in the observations in the following table below:

Table 4. Observation results of Meeting 3 Cycle I

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>80</td>
<td>40%</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>100</td>
<td>50%</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>20</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Amount</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

According to the observations in the table, there were 80 undeveloped children, 100 children started to develop, and 20 children progressed as expected.

Reflection

Based on these observations, the researchers and the team assessed and discussed the challenges that cycle I's implementation faced, and they identified the following challenges: Paint your fingers Comparing the results from the first meeting to the third meeting reveals an increase in spatial visual intelligence.

Based on the recapitulation results in cycle I, it turned out that the child had not reached the expected target, namely Developing According to Expectations of 85%. Then it is continued in cycle II by using objects, where the teacher provides objects that can be seen by children.

2.2.4. Cycle II Meeting 1

The process of improving children's visual-spatial intelligence through finger painting in cycle I has increased even though it has not reached 85%..

Action Implementation Stage

Implementation of this action with the theme of the universe with the sub-theme of natural phenomena. Below is a table of data from observations at meeting 1 cycle II.

Table 5 Observation Results of Meeting 1 Cycle II

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>20</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>80</td>
<td>40%</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>100</td>
<td>50%</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Amount</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

Reflection

According to the findings and procedures used in Cycle II Meeting 1, there were still lots of kids who could not fully comprehend finger painting exercises, because children disrupted their peers'
learning during the session by running about. Additionally, if learning is not entertaining, kids quickly become disinterested. The observer claims that because teachers frequently just pay attention to one group and exercise insufficient control over the classroom, learning is not always at its best. In cycle II meeting 2, it was thus continued.

This can also be seen in [11] in a study entitled "Efforts to Develop Fine Motor Skills through Finger Painting in Children Group B Ba Aisyiyah 4 Tegalsepur Klaten Middle School Year 2013/2014". The results of this study showed the development of fine motor skills in group B children in BA Aisyiyah 4 Tegalsepur Klaten Tengah through finger painting, before action 33.63%, in cycle I 59.54%, in cycle II 80.85%. The conclusion of this study is that through finger painting can develop children's fine motor skills in BA Aisyiyah 4 Tegalsepur Klaten Middle School Year 2013/2014.

2.2.5. Cycle II Meeting 2

The activities carried out at this planning stage were the researcher making preparations for learning at meeting 2.

Action Implementation Stage

The universe is the main theme of this cycle, with heavenly bodies serving as a sub-theme. The kids paid close attention to the teacher's explanation during cycle II's second meeting, which helped the kids' Finger Painting exercise go smoothly. Kids are better able to comprehend good finger painting. The reason the kids were enthusiastic was because they had cut out two patterns during the second meeting—the moon and the stars—and they were eager to finish them. The outcomes of the second meeting observation are listed in the table below.

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>0</td>
<td>0 %</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>100</td>
<td>50 %</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>100</td>
<td>50 %</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>0</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Table 6. Observation results of Meeting 2 Cycle II

Reflection

From the results and processes carried out in Cycle II meeting 2 there were still many students who did not understand and understand well about finger painting activities. Because during the lesson there were children running around and disturbing their friends during the lesson. In addition, children quickly get bored if learning is not interesting. So it was continued in cycle II meeting 3.

This is also corroborated by previous research, namely [12] in his thesis entitled "Improving Children's Visual Spatial Intelligence through Montage Activities in Group B of Pertiwi Ngaran II Polanharjo Kindergarten" In his research, Oktori tried to carry out classroom learning actions to improve children's Visual Spatial intelligence through Montage activities in group B of Pertiwi Ngaran II Polanharjo Kindergarten. The data collection used were observation, interview and documentation methods Through his research, Oktori found an increase in children's Visual Spatial intelligence which was shown by an increase in the percentage of children's learning outcomes.

2.2.6. Cycle II Meeting 3

At meeting 3. The preparations made were with the collaborator teachers discussing the themes and sub-themes to be used. After discussing the researchers prepared a daily activity plan, observation sheets, tools and coloring materials for Finger Painting to be used in the Finger Painting activities.

Action Implementation Stage

In this cycle, the theme is the universe with the sub-theme of celestial bodies, the universe, and the sub-theme of plants. At meeting 3 cycle II, the children paid attention to the teacher's explanation well so that the children doing finger painting activities could run smoothly. Children better understand good finger painting. The children looked enthusiastic because at meeting 3 there were two patterns that the children cut out, namely the moon and the stars so that the children were excited to finish them. The following is a table of observations from meeting 3 cycle II.

Tabel 7. Observation Results of Meeting 3 Cycle II
3. DISCUSSION

The research conducted was a class action research conducted in 2 cycles. The cycles carried out in this study consisted of cycle I and cycle II. Each cycle goes through several stages, namely planning, action, observation and reflection. In cycle II these stages were carried out with improvements to the problems in learning in cycle I.

The research results were obtained from the results of observations and documentation of children's data. These results are to determine the increase in the ability of children's visual spatial development using the finger painting technique in group B children at Merauke Kindergarten. Data analysis in this study occurred interactively both before, during and after the study. Before the research was carried out, the researcher had carried out an analysis, namely determining the formulation of the problems that emerged, then the analysis was also carried out when collecting data on the child's initial abilities. The analysis before this study aims to determine the extent of the child's problems and abilities so that appropriate research actions can be carried out. Based on the results of observations about the implementation of learning and the impact of the stimulation that has been given to children.

Visual spatial Intelligence is the ability to imagine an image or other shape that can be seen by the eye [13]. The data from the second cycle observation on the good criteria means that Developing According to Expectations (BSH) has increased by 150 children (80%) while the criteria for sufficient development have decreased to 50 children (20%) and the criteria for poor and bad have decreased to 0 children or 0%. Based on these results, it can be said that cycle II has reached the success indicators that have been set so that this research can be stopped. Group B Kindergartens in Merauke have increased.

<table>
<thead>
<tr>
<th>Number</th>
<th>Criteria</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not Developed</td>
<td>0</td>
<td>0 %</td>
</tr>
<tr>
<td>2</td>
<td>Start Growing</td>
<td>0</td>
<td>0 %</td>
</tr>
<tr>
<td>3</td>
<td>Growing as Expected</td>
<td>180</td>
<td>90 %</td>
</tr>
<tr>
<td>4</td>
<td>Very Well Developed</td>
<td>20</td>
<td>10 %</td>
</tr>
<tr>
<td>Jumlah</td>
<td></td>
<td>200</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Thus, finger painting activities can be said to enhance children's visual spatial intelligence. Children's ability to use their visual-spatial skills to paint with their fingers correctly and in accordance with the painting's subject improves with an improvement in their visual-spatial intelligence.

The previous research that can strengthen this research is [14] in a study entitled Increasing Visual-Spatial Intelligence Through Block Play In Group B At Mekar Haya-Haya Orchid Kindergarten, West Limboto District, Gorontalo Regency. The result of his research is that the hypothesis of this classroom action research states that "If learning uses block games, then visual-spatial intelligence can increase in group B children of Mekar Haya-Haya Orchid Kindergarten, West Limboto District, Gorontalo Regency".

In cycle I, children who obtained good criteria showed an increase of 10% or 20 children. In cycle II, those who got good criteria experienced an increase of 90% or 180 children who scored above 70 - 80 so that they obtained the expected Developing criteria. This research can be said to be successful because 85% of the 200 children in Group B of Merauke Kindergarten have achieved the predetermined success indicators.

AUTHORS’ CONTRIBUTIONS

CRISTIANA NORMALITA DE LIMA ORGANIZES THE IDEAS PRESENTED AND ARRANGES THE BACKGROUND. DHARMA GYTA SARI HARAHAP COMPILED THE INSTRUMENTS TO BE USED IN THE RESEARCH. MUH RAFITY COMPILED THE STEPS TAKEN IN CLASSROOM ACTION RESEARCH. FERRY IRAWAN AND RIVALDO PAUL TELUSSA ANALYZED THE RESEARCH DATA. FIVETHERMORE, ALL THE WRITING...
TEAMS COMPILED THE RESULTS AND DISCUSSIONS, CONCLUSIONS, AND MANUSCRIPTS TOGETHER.

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REFERENCES


