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Implementation of Numbered Head Together Assisted by Number Card Media to Improve the Ability to Recognize Number Symbols at Al-Barokah Kindergarten Jambi City

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ABSTRACT

This research aims to improve the ability of early childhood students to recognize number symbols through the implementation of the *numbered head together* method assisted by number card media at Al-Barokah Kindergarten, Jambi City. The background of this study is the low ability of children to recognize number symbols, including counting concrete objects, identifying numbers according to their symbols, and calculating quantities. Based on initial observations, the majority of children were at the "Not Yet Developing" (BB) and "Starting to Develop" (MB) stages, indicating a lack of mastery in basic numerical concepts. This research used the Classroom Action Research (CAR) method conducted in two cycles. During the pre-action phase, all children were categorized as BB (50%) and MB (50%), with none achieving the "Developing as Expected" (BSH) or "Very Well Developed" (BSB) stages. After interventions using the *numbered head together* method and number card media, the results showed significant improvements. At the end of Cycle I, 44% of the children reached the BSH stage, and 6% reached the BSB stage. A more significant improvement occurred in Cycle II, where 87% of the children were categorized as BSB, and 17% as BSH. By the end of Cycle III, no children remained in the BB or MB categories. The conclusion of this study indicates that the implementation of the *numbered head together* method assisted by number card media is effective in enhancing the ability of 5-6-year-old children to recognize number symbols at Al-Barokah Kindergarten. This method successfully helped children grasp numerical concepts in an interactive and enjoyable manner, improving their cognitive ability to recognize number symbols and their counting skills.

Keywords: Ability to Recognize Number Symbols, Early Childhood, Numbered Head Together, Number Card Media

Introduction

Learning for early childhood education is essential, as children at this stage acquire knowledge through enjoyable activities such as running, playing with real objects, conducting small experiments, or even gardening. Early childhood education is oriented toward play-based activities[1], as it is well-known that children learn and gain valuable experiences through play. Therefore, the learning activities in Islamic Early Childhood Education (PIAUD) are specially designed with the method of learning through play.

Learning through play helps extend children's concentration.[2] Early childhood learning requires teaching aids, commonly referred to as instructional media, which help sustain children's attention, prevent boredom, and maintain focus for a relatively long period compared to learning without media.[3] To develop aspects such as moral and religious values, language, cognitive abilities, social-emotional skills, physical motor skills, and art in early childhood[4], diverse and varied learning media are necessary to provide maximum stimulation for optimal results.

Some instructional media are specifically designed by teachers to develop or stimulate these abilities, while others are widely available in the market, making them easily accessible. According to Hamalik, the general benefits of instructional media are to facilitate interaction between teachers and children, making the learning process more effective and efficient. Specifically, the benefits include:[5]

1. Standardizing the delivery of learning material.
2. Making the learning process clearer and more engaging.
3. Enhancing interactivity in learning through two-way communication, as opposed to one-way teacher lectures.
4. Helping achieve learning goals effectively with minimal time and effort.
5. Improving children's learning outcomes.
6. Allowing learning to occur anytime and anywhere.
7. Creating a positive attitude toward learning materials and processes.
8. Encouraging teachers to adopt more positive and productive roles.

Teachers play a crucial role in selecting and using appropriate instructional media for early childhood education. Poor media choices can lead to children losing focus, feeling uninterested, or becoming bored with the learning activities. Hence, understanding children's developmental stages is essential when selecting instructional media.[6] Different stages require tailored media to address specific needs.

Selecting instructional media involves several considerations, including teachers' familiarity with the media, the media's ability to depict concepts better than the teacher alone, and its appeal to children's interests and attention.[7]

Cognitive development is the ability of a child to understand an object. In learning, it includes the ability to understand number concepts. According to the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 146 of 2014 on the 2013 Curriculum for Early Childhood Education, basic competencies (KD) 3.12 and 4.12 emphasize children's ability to recognize and demonstrate early literacy through play. This literacy includes letters and numbers.[8]

Number concepts form a fundamental basis for developing mathematical skills and preparing children for primary education. Introducing number concepts at an early age is critical, as it facilitates the learning process in

subsequent educational stages, particularly in mathematics.[9] Understanding numbers early enables children to quickly grasp more complex mathematics in primary school.

Research by Wulandari, Wirya, and Tirtayani found that implementing the Numbered Heads Together learning model assisted by number card media significantly improved the ability to recognize number symbols.[10] In Group B2, the average score of children's ability to recognize number symbols increased from 72.3% (moderate category) in Cycle I to 82.65% (high category) in Cycle II, showing a 10.35% improvement.

Understanding number concepts includes counting objects, writing symbols for quantities, and grouping objects based on "more, fewer, and equal". Children who grasp number concepts can perform more complex mathematical operations, such as calculations. This is highly beneficial for their daily lives and prepares them for further education.

TK Al-Barokah is an early childhood education institution in Jambi City with 16 children aged 5-6 years. In the scope of development for children aged 5-6 years, the ability to recognize number symbols is observed through several indicators of developmental achievement. These include matching concrete objects with number symbols from 1 to 10, identifying numbers when shown their symbols, and stating the total number of objects by counting. Among the group, 10 children (60%) have not yet developed these skills, indicating the need for focused support to enhance their numerical recognition and counting abilities.

TK Al-Barokah, located in Kota Jambi, is an Early Childhood Education institution with 16 children aged 5-6 years. Based on an initial observation conducted on September 4, 2024, the development of children's ability to recognize number symbols showed that most of them were still at a stage requiring improvement. Specifically, 10 children, or 60% of the total students, were unable to connect concrete objects with number symbols 1-10, identify numbers when shown their symbols, or count objects independently. This data highlights the need for further guidance to help children achieve the expected developmental indicators for their age. Addressing this issue requires well-planned and age-appropriate stimulation, which can be effectively provided through Early Childhood Education (PAUD). A learning model that fosters enthusiasm and active participation is essential to ensure children can absorb the material effectively. One such model suitable for addressing the low understanding of numerical concepts among young children and stimulating their comprehension is the "Numbered Heads Together" (NHT) learning model.

According to Suprijono, as cited by Hapsari, the NHT model begins with numbering, where groups are formed, and each group member is assigned a number.[11] The teacher poses several questions, prompting group members to "put their heads together" in discussion to formulate answers. Then, the teacher calls on students with the same number from each group to share their answers. This model encourages interaction among group members to collaboratively solve tasks provided by the teacher. It also helps children focus during group discussions, enabling them to better understand the learning material. The NHT model thus facilitates both active engagement and deeper comprehension among young learners.

Method

The research conducted is a qualitative classroom action research involving two cycles aimed at evaluating improvements in learning outcomes and children’s

activities through the implementation of the Numbered Heads Together method, supported by numerical card media.[12] Each cycle comprises two meetings and follows four structured stages: planning, implementation, observation, and reflection.[13] The study seeks to enhance and refine the learning process conducted by teachers while addressing issues in developing children's cognitive skills, particularly their ability to recognize number symbols. By employing the Numbered Heads Together method assisted by numerical card media, the research aims to foster significant progress in children's recognition of numerical symbols.

Classroom action research is conducted by researchers in a classroom setting to evaluate the impact of implemented actions on the research subjects. Its primary purpose is to practically enhance the quality and outcomes of the learning process. This type of research focuses on the classroom environment and learning activities, with the researcher closely observing activities during the implementation process to assess children's abilities.

The research was conducted in 2024 at TK Al-Barokah, Kota Jambi, a location chosen based on initial observations indicating that children's ability to recognize numbers had not achieved the desired outcomes. This motivated the researcher to examine the effectiveness of the Numbered Heads Together method with numerical card media in improving this skill. The research subjects consisted of 16 students aged 5–6 years at TK Al-Barokah during the 2024/2025 academic year.

The research was systematically conducted using cycles, adapting to field conditions in alignment with the action research framework proposed by Kemmis & McTaggart.[14] The first cycle aimed to assess initial improvements in recognizing number symbols. The planning stage involved preparing lesson plans and required media. Implementation consisted of initial activities like prayers, greetings, and attendance checks; core activities where teachers demonstrated numerical card media and guided students; and closing activities with prayers, discussions, and feedback. Observations were made throughout to collect data on student engagement and outcomes, and reflections analyzed the process to identify necessary revisions for the subsequent cycle.

Cycle II built on the findings from Cycle I, addressing its shortcomings and focusing on reinforcement to improve the children's ability to recognize number symbols further. The steps in Cycle II mirrored those in Cycle I, with additional corrective measures implemented based on reflections from the initial cycle. If desired outcomes were not achieved in Cycle II, further cycles would be implemented to meet research objectives.

The data collection technique is a crucial step in research, as the main objective of research is to obtain data. The methods used in this study include observation and documentation. Observation is a systematic and deliberate effort to collect data, often supported by observation sheets as instruments to assess children's behavior during learning processes. Documentation involves gathering records, photos, or monumental works to aid data collection, such as discussion reports, test results, meeting notes, lesson plans, and student projects. Data analysis is conducted qualitatively through interactive analysis, encompassing data reduction, display, and conclusion verification. Reduction involves filtering essential data to simplify subsequent data collection. Data display uses narrative texts to provide clarity and facilitate planning. Conclusions are drawn based on organized

information, supported by descriptive percentage analysis for numerical data. The study ensures data validity through triangulation, cross-checking sources for accuracy. Additionally, the research schedule spans 2024, covering proposal submission, field data collection, analysis, and final report writing.

Results and Discussion

Results

Pre-Cycle

In the pre-cycle stage conducted on Tuesday, November 12, 2024, at Al-Barokah Kindergarten, Jambi City, the action plan was meticulously designed based on the Daily Lesson Plan (RPPH). The focus was on enhancing children's ability to recognize numerical symbols using the Numbered Heads Together (NHT) method supported by number card media. The learning theme was fruit plants, with the sub-theme "apple," suitable for five-year-old children. Core competencies targeted included cognitive and motor skills, as well as religious, independent, and responsible attitudes. Initial activities aimed to create a positive learning environment through prayer, singing, and gross motor activities like jumping rope.

During the implementation, the core learning activities utilized an interactive approach to introduce numerical symbols in an engaging manner. Children were encouraged to discuss fruit plants, create apple collages, and count apples using number cards as the primary learning media. This approach facilitated visual and kinesthetic learning of numerical concepts. Additionally, children practiced writing the word "apple," integrating cognitive and fine motor skills. The session ended with a reflection period, where children discussed their daily activities, shared experiences, and received positive reinforcement to boost confidence. Results were measured through anecdotal notes, checklists, and children's work, forming the basis for evaluating and improving subsequent cycles.

Observations revealed that the children's ability to recognize numerical symbols was still at a limited developmental stage. According to the data, 50% of children were categorized as "Not Yet Developed" (BB) and the other 50% as "Starting to Develop" (MB) across all indicators, including matching concrete objects with numerical symbols 1-10, identifying numbers from symbols, and counting objects. None achieved "Developing as Expected" (BSH) or "Exceeding Expectations" (BSB). This highlighted the need for a more effective and engaging teaching strategy. Reflection on the pre-cycle findings indicated the potential of communication skills among children, which could be leveraged through the NHT method and number card media to improve learning outcomes in subsequent cycles.

Cycle I, Meeting 1

The first meeting of Cycle I took place on Monday, November 18, 2024, at Al-Barokah Kindergarten, Jambi City. The lesson was planned based on the Daily Lesson Plan (RPPH) with the theme "Fruit Plants" and the sub-theme "Bananas." The objective was to enhance children's ability to recognize numerical symbols through the Numbered Head Together (NHT) method assisted by number card media. The session started with engaging activities such as reciting prayers, practicing short surahs, and performing gross motor activities like jump rope. The core learning activities included storytelling, discussions about fruit plants, printing banana stems with food coloring, and counting bananas using number cards. The preparation also involved using number cards, drawing books, and banana stems to create an

interactive and meaningful learning experience.

During the implementation phase, the children were actively engaged in various activities to explore the sub-theme, such as storytelling, conversations about fruit plants, and hands-on activities like counting and recognizing banana-related objects. Observations revealed that 87% of the children fell into the "Emerging Development" (MB) category for three key indicators: matching objects with numerical symbols, naming numbers based on symbols, and counting objects. However, 13% of children were still in the "Not Yet Developed" (BB) category, with no children reaching the "Expected Development" (BSH) or "Exceeding Expectations" (BSB) levels. These results showed promising progress in using the NHT method but highlighted the need for adjustments to enhance understanding and participation.

The first meeting demonstrated that the NHT method supported by number card media positively impacted children's numerical symbol recognition. While most children showed progress, some required additional support to fully grasp the concepts. Challenges included the varying pace of comprehension and active involvement among the children. These findings underscored the need for more individualized guidance and diversified learning tools to address these gaps. The reflections from this cycle provide valuable insights for refining strategies in the next cycle, aiming to improve outcomes and support all children in achieving higher developmental categories.

Cyrcle 1 meeting 2

On Tuesday, November 19, 2024, at Al-Barokah Kindergarten in Jambi City, the second meeting of Cycle I focused on implementing the daily learning plan (RPPH) with the theme "Fruit Plants" and the subtheme "Jackfruit." The goal was to enhance the children's ability to recognize numerical symbols through the Numbered Head Together (NHT) method, supported by number card media. The initial activities aimed to create a positive learning atmosphere with prayers, reciting short Quranic verses, singing thematic songs, and engaging in gross motor activities like tossing a ball. The core activities included interactive exploration, storytelling about fruit plants, distinguishing object names, performing eco-printing using jackfruit leaves, and writing the word "jackfruit." Materials like jackfruit leaves, small hammers, buckets, and number cards enriched the learning experience. Character values such as religiousness, independence, responsibility, and perseverance were integrated into each stage of the activities.

The planned activities were executed smoothly, starting with engaging opening routines that energized the children. They enthusiastically participated in prayers, Quranic recitations, and ball games. During the core activities, the collaborative NHT method encouraged children to discuss and work together in identifying numerical symbols. The eco-printing activity with jackfruit leaves became a favorite, fostering creativity and fine motor skills. Writing the word "jackfruit" helped link numerical symbols to tangible objects, making the learning process more concrete. The session concluded with a reflective activity where children shared their experiences and received positive reinforcement from the teacher. Although the implementation was effective and meaningful overall, observations revealed a need for improved strategies to engage less active children more effectively.

The observation results from Cycle I, Meeting 2, highlighted notable progress in the children's ability to recognize numerical symbols. Among three key

indicators, 50% of the children were categorized as Starting to Develop (MB), 44% as Achieving Expectations (BSH), and 6% as Very Well Developed (BSB), with no children in the Not Yet Developed (BB) category. This consistent distribution across indicators—linking objects with symbols, identifying numbers by symbols, and counting objects—demonstrates the method's effectiveness. However, further efforts are required to help children in the MB category reach higher achievement levels. Reflection on these results underscores the need for more intensive guidance and diverse activities to maximize each child's potential and ensure continuous improvement in subsequent learning cycles.

Cycle 2 meeting 1

The first meeting of Cycle II was conducted on Monday, November 25, 2024, at Al-Barokah Kindergarten, Jambi City. The lesson plan was carefully crafted to enhance children's ability to recognize numerical symbols through the Numbered Head Together (NHT) approach, supported by number card media. The theme was "Plants," with the subtheme "Fruit Plants: Oranges," integrating numerical concepts and nutritional education about oranges. Activities were planned to include opening prayers, recitation of short surahs, singing, and gross motor games such as placing balls into baskets. The core activities focused on discussing the vitamins in oranges, coloring orange pictures, and writing the word "o-r-a-n-g-e" with interactive tools like number cards, crayons, and real oranges. This approach aimed to blend cognitive, motor, and social skills development while fostering religious values, responsibility, and perseverance.

The implementation began with an engaging atmosphere, featuring group prayers, singing, and gross motor activities to prepare the children emotionally and physically. During the core session, teachers guided discussions about the vitamin content in oranges, facilitated coloring activities linked to number recognition, and taught the children to write the word "orange" to enhance early literacy. The dynamic NHT method enabled children to work collaboratively in small groups, matching numerical symbols with physical oranges, under the teacher's guidance. The session ended with a simple reflection, reinforcing the learning outcomes, and a closing prayer. This engaging and meaningful experience resulted in active participation from the children, showcasing a marked improvement in their enthusiasm and learning engagement.

Observations from the session, as detailed in Table 8, highlighted a noticeable improvement in the children's ability to recognize numerical symbols across three indicators: matching objects to numbers, identifying numbers by symbols, and counting objects. The data revealed that 44% of the children met the "Developing as Expected" criterion, 31% achieved "Very Well Developed," and 25% were in the "Starting to Develop" category. None were in the "Not Yet Developing" category, reflecting the effectiveness of the NHT method with number card media. However, the 25% in the "Starting to Develop" category suggests the need for additional strategies to support these children in reaching the desired developmental milestones. With targeted adjustments, even better outcomes are anticipated in subsequent meetings.

Cycle 2 meeting 2

On Tuesday, November 26, 2024, the second meeting of Cycle II was meticulously planned to focus on introducing numerical symbols with the theme of fruit plants, particularly starfruit. The plan emphasized active student

involvement through the Numbered Head Together approach, supported by numeric card media to enhance their understanding of numerical symbols. The learning activities began with a warm-up session, including prayers, short Quranic recitations, and motor activities with songs. The core activities engaged children in discussing starfruit, creating collages using origami, stamping starfruit with food coloring, and writing the word “B-e-l-i-m-b-i-n-g.” Educational materials like numeric cards and drawing books were prepared to ensure a dynamic and interactive learning process.

During the implementation phase, the lesson plan was executed with enthusiasm and focus. The session opened with lively activities, such as singing, clapping, and praying, to create a welcoming classroom atmosphere. In the main activities, teachers facilitated small group collaborations, where children crafted collages and learned numbers through numeric cards. The students showed excitement while stamping and coloring starfruit, which not only sparked creativity but also improved fine motor skills. Observations and assessments were conducted through anecdotal notes, artwork evaluation, and checklists, which revealed an active engagement of students in collaborative learning. This strategy successfully reinforced their understanding of numerical symbols in a fun and interactive manner.

The reflection on Cycle II Meeting 2 highlighted a significant improvement in the children’s ability to recognize numerical symbols. All students reached the categories of "Developing as Expected" (31%) and "Developing Very Well" (69%), with none remaining in the "Not Yet Developed" or "Starting to Develop" stages. These results affirmed the effectiveness of the Numbered Head Together method with numeric card media, as it facilitated a multisensory and engaging learning experience. Despite the success, maintaining some students' focus during activities remained a challenge. Future sessions could benefit from differentiated strategies and varied media to sustain attention. Overall, the meeting achieved its goals by fostering a joyful and cognitive learning environment aligned with developmental indicators.

Cycle III Meeting 1

In Cycle III Meeting 1, conducted on Wednesday, November 27, 2024, the lesson planning focused on introducing numerical symbols using the theme of land vehicles, specifically cars. The learning activities were designed to actively engage children through the Numbered Head Together approach, incorporating number cards to enhance their understanding of numerical symbols. The session commenced with an opening that included prayers, recitation of short surahs, and gross motor activities like movement and songs. In the core activities, children participated in discussions about cars, created car-themed collages using origami, painted car images with food coloring, and practiced writing the word "M-o-b-i-l." Learning media, such as number cards and drawing books, were prepared to ensure an interactive and engaging process.

The implementation proceeded as planned, beginning with fun introductory activities like singing, clapping, and prayers to motivate the children. During the core learning phase, teachers guided small groups in collaborative tasks such as making collages and recognizing numbers using the number card media. The children demonstrated enthusiasm while drawing and coloring cars, which fostered their creativity and fine motor coordination. Observations of their creations, anecdotal notes, and checklist evaluations tracked their progress. This cycle emphasized active participation in collaborative

learning, effectively meeting the objectives of introducing numerical symbols.

Observation results highlighted significant progress, with all children achieving higher developmental levels. None fell into the BB (Not Yet Developed) or MB (Starting to Develop) categories. Instead, 17% reached the BSH (Developing as Expected) level, while 87% achieved the BSB (Very Well Developed) level. These outcomes reflected improved abilities in associating concrete objects with numerical symbols, identifying numbers when shown symbols, and counting objects accurately. Reflection revealed the method's effectiveness in fostering interactive and concrete understanding. While most children excelled, maintaining focus in a few required enhanced strategies and varied media. Overall, the session successfully created an enjoyable learning environment that supported children's cognitive growth.

Discussion

The pre-action results indicated that children's ability to recognize number symbols at TK Al-Barokah in Kota Jambi was significantly low. About 50% of the children were categorized as Not Yet Developed (NYD), while the remaining 50% were in the Beginning to Develop (BD) category. No child reached the categories of Developing as Expected (DE) or Very Well Developed (VW). These findings highlighted the difficulty children had in connecting concrete objects with numerical symbols, naming numbers according to the displayed symbols, and accurately counting objects.

During Cycle I, a slight improvement was observed. In the first session, 87% of the children were in the BD category, and 13% remained in NYD. However, no child advanced to DE or VW. By the second session, progress was notable, with 44% achieving DE and 6% reaching VW, while 50% remained in BD. This demonstrated that the learning methods employed were beginning to have a positive effect, though further refinements were necessary.

In Cycle II, more significant progress emerged. During the first session, 25% of children were in BD, 44% in DE, and 31% in VW. By the second session, optimal results were achieved, with 69% in VW and 31% in DE, leaving no children in NYD or BD. This trend continued into Cycle III, where 87% were in VW and 13% in DE by the first session. These results confirmed the effectiveness of the implemented strategies in improving the children's understanding of numerical symbols.

The success of this approach can be attributed to several factors. The Numbered Heads Together method, combined with numerical card media, encouraged collaboration, enabling children to learn from their peers and feel more motivated. The use of concrete learning tools made abstract numerical concepts more accessible, while varied activities such as games and number crafts ensured a lively and engaging learning environment. These efforts supported the holistic development of the children, aligning with the goals of early childhood education.

The findings of this study align with constructivist learning theory[15], which emphasizes that children construct knowledge through active interaction with their environment. The collaborative learning approach embedded in the Numbered Heads Together method allowed children to build understanding not only through hands-on activities but also through social interaction and peer learning.[16] By incorporating concrete media like number cards, the method addressed the developmental needs of early learners, who often require visual and tactile stimuli to grasp abstract concepts.[17] Academically, this study

contributes to the growing body of research on early childhood education by demonstrating the effectiveness of combining collaborative learning strategies with interactive media to enhance cognitive abilities. It also provides a practical framework for educators in designing structured, engaging, and developmentally appropriate learning experiences, particularly in introducing abstract concepts such as numerical symbols.

Conclusion

The research findings and data analysis indicate that children at TK Al-Barokah Kota Jambi made significant progress in recognizing number symbols through the action cycle stages. Initially, children's abilities were categorized as "Not Developing" (BB) or "Beginning to Develop" (MB), with no children reaching the "Developing as Expected" (BSH) or "Developing Very Well" (BSB) categories. However, after applying the Numbered Head Together method with number cards, there was a marked improvement. By Cycle I, Meeting 2, 44% of children reached the BSH category, and 6% were in the BSB category. This progress became more pronounced in Cycle III, where 87% of children were in the BSB category, and 17% were in the BSH category. By the end of Cycle II, no children remained in the BB or MB categories. The use of this method was proven effective in enhancing children's ability to recognize and work with number symbols, counting objects, and matching numbers with symbols.

To further enhance children's number recognition abilities, it is recommended that the Numbered Head Together method with number cards be consistently applied at TK Al-Barokah Kota Jambi. Teachers should diversify the method by incorporating more engaging teaching tools or educational games to maintain children's enthusiasm and participation. Additionally, providing individual support for children who need more time to grasp number concepts should be a priority. The school is encouraged to offer training for teachers to master various innovative teaching methods, thus enhancing the overall quality of education. Finally, collaboration with parents to support learning at home through activities like number games will help reinforce the lessons taught at school, ensuring more effective learning outcomes.

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