IMPROVING RECOGNITION OF NUMERICAL CONCEPTS 1–10 THROUGH PICTURE NUMBER CARD MEDIA IN GROUP A AT SPS RIYADUSSHOLIHIN SUBANG 2025

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Abstract: This study aims to improve children's recognition of numerical concepts from 1 to 10 through the use of picture number card media in Group A at SPS Riyadussholihin, Subang. This classroom action research (CAR) was conducted in the 2024/2025 academic year involving 19 students aged 4–5 years. Data were collected using written tests, observation sheets, and documentation. The learning process applied visual-based methods using picture number cards to facilitate number recognition. The findings indicate that the use of picture number cards increased children's learning motivation and enhanced their understanding of number concepts compared to conventional methods. The conclusion of this study confirms that picture number cards are effective in improving early childhood numeracy skills by providing a fun, interactive, and developmentally appropriate learning experience.

Keywords: picture number cards, learning motivation, visual-based learning method.

INTRODUCTION

Early childhood education plays a crucial role in building the foundational skills necessary for children's intellectual and emotional growth. During this phase, children are in what developmental psychologists call the "golden age," a period where brain development is most rapid and educational stimulation has lasting impact. One of the key areas of development in early childhood is cognitive growth, particularly the ability to understand and recognize numbers. Number recognition from 1 to 10 is a basic but essential mathematical competency that lays the groundwork for more complex numeracy in later years. However, despite its importance, many early childhood students still struggle to identify, sequence, and understand numerical symbols and their meanings. This issue has been observed in various early childhood institutions, including SPS Riyadussholihin in Subang, where the majority of students in Group A—aged between four and five—showed difficulty in recognizing numbers and associating them with real quantities. These learning challenges were largely attributed to monotonous teaching strategies, limited visual media, and a lack of developmentally appropriate learning tools. At this critical stage of development, children benefit most from learning approaches that are active, engaging, and visually stimulating. According to Piaget's theory of cognitive development, children in the preoperational stage are capable of symbolic thinking but still rely heavily on visual and concrete representations to grasp abstract concepts such as numbers. Similarly, Vygotsky emphasized the importance of learning through tools and social interaction, highlighting that children develop better when given supportive guidance within their zone of proximal development. Visual learning media, therefore, act not only as tools for instruction but also as scaffolding devices that enhance comprehension. Among the various visual aids available, picture number cards have shown particular promise in early numeracy instruction. These cards combine numerical symbols with matching images—such as the number "3" paired with three apples—which helps children understand quantity, develop memory, and build associations through visual context. Previous studies have indicated that using such tools improves children's focus, motivation, and accuracy in identifying numbers, especially when presented in game-like or interactive formats.

In the context of SPS Riyadussholihin, many students were exposed to repetitive instructional formats that lacked sensory engagement, such as plain number posters or routine oral counting. As a result, children demonstrated low enthusiasm and limited achievement in basic numeracy tasks. Recognizing this, the present study seeks to investigate the use of picture number card media as a strategy to enhance children's number recognition skills. The cards are expected to provide meaningful learning experiences by linking visual stimuli with numerical understanding, thereby promoting deeper cognitive processing. Moreover, by incorporating this media into classroom activities such as counting games, matching exercises, and visual storytelling, children will not only learn numbers more effectively but also enjoy the process. It is anticipated that such an approach will boost students' motivation, participation, and overall learning outcomes.

This research uses a classroom action research model, which is particularly effective in early childhood settings where iterative cycles of planning, acting, observing, and reflecting are essential for improvement. As the teacher and researcher are the same person, the implementation of the media can be carefully tailored and adjusted based on immediate feedback and observations. The goal is to document the effectiveness of picture number card media in improving number concept recognition among Group A students at SPS Riyadussholihin. Specifically, the study aims to answer three main research questions: What is the baseline ability of students in recognizing numbers 1 to 10 before the intervention? How is the picture number card media applied during the learning process? And what improvements are observed after its implementation? In alignment with these questions, the objectives of the study are to assess students' initial numeracy skills, analyze the instructional process using the media, and evaluate the outcomes after its application.

Through this study, it is expected that picture number card media will not only help students recognize numbers more effectively but also serve as a practical example of how developmentally appropriate learning tools can be applied in early childhood education. The results are anticipated to contribute to the broader discourse on best practices in teaching early mathematics, particularly in the Indonesian PAUD context, where such innovations are increasingly needed. Furthermore, the findings may offer valuable insights for educators, curriculum developers, and policymakers seeking to enhance the quality of early numeracy instruction across the country.

METHOD

This study employed a classroom action research (CAR) design to improve number concept recognition among early childhood learners through the use of picture number card media. Action research was selected as the most appropriate methodology because it enables educators to identify, implement, and evaluate changes in instructional strategies within their own teaching environment. The research was conducted at SPS Riyadussholihin, a PAUD institution located in Subang, West Java, during the 2024/2025 academic year. The participants consisted of 19 students in Group A, aged between 4 and 5 years, comprising 12 boys and 7 girls. The selection of the research subject was based on the researcher's direct involvement as a classroom teacher and on preliminary findings indicating low numeracy skills among the majority of students in this group.

Data were collected using multiple instruments to ensure validity through triangulation. The primary data collection tools included structured observation sheets, number recognition tests, and documentation of learning activities. Observations focused on the students' ability to recognize, sequence, and match numbers with corresponding quantities. Pre-tests were administered before the intervention to assess the students' initial abilities, while post-tests were conducted at the end of each research cycle to evaluate progress. Documentation, such as photos and teacher field notes, was used to capture and analyze classroom dynamics, student engagement, and the implementation of the learning media.

The implementation of the research was divided into two main cycles following the action research framework developed by Kemmis and McTaggart (1988), which includes planning, acting, observing, and reflecting. In each cycle, the teacher designed learning activities using picture number cards that visually represented numbers 1 to 10, each paired with corresponding illustrations. During the acting phase, the teacher facilitated group and individual tasks using the cards, allowing children to interact directly with the media through matching games, counting exercises, and number sequencing tasks. The observation and reflection phases allowed the teacher-researcher to assess outcomes and refine instructional strategies for the following cycle.

For data analysis, both quantitative and qualitative methods were applied. Quantitative data from the pre- and post-tests were analyzed using descriptive statistics, including percentage increases in number recognition scores. These scores were categorized into four developmental levels: not yet developed, starting to develop, developing as expected, and very well developed. Qualitative data from observations and documentation were analyzed thematically to identify changes in student behavior, participation, and motivation throughout the learning process. These findings were then interpreted to assess the overall impact of the picture number card media on students' ability to recognize and understand numbers.

By integrating multiple sources and methods of data collection, this research aimed to provide a comprehensive and contextualized understanding of how visual learning media can support numeracy development in early childhood. The methodological approach also ensured that the findings were both practically relevant and theoretically grounded, thereby contributing to best practices in early mathematics education.

RESULT AND DICSUSSION

Results The results of this classroom action research indicate a significant improvement in the ability of children in Group A at SPS Riyadussholihin to recognize number concepts 1–10 after the implementation of picture number card media. In the preliminary observation, it was found that many children were unable to identify numbers accurately, sequence them correctly, or associate them with quantities. Before the intervention, only 4 out of 19 students (21.05%) were categorized as “developing as expected” or above, with the majority still at the “not yet developed” or “starting to develop” stages. These results confirmed that the existing learning approach, which lacked variation and engaging instructional media, was not sufficient to stimulate children’s numerical understanding.

During the first cycle of intervention, students were introduced to visual-based learning activities using picture number cards that illustrated numbers alongside corresponding images, such as animals or objects. These visual supports allowed children to engage with the materials both cognitively and emotionally, thereby increasing motivation and focus. At the end of Cycle I, post-assessment showed that 52.63% of students reached the expected development level, indicating a

considerable increase compared to the precycle. Nevertheless, some children remained inattentive or hesitant during group tasks, and a portion of them still relied heavily on guidance to complete number-matching activities. These observations highlighted the need to further refine the strategy in the subsequent cycle.

In Cycle II, the teacher improved the instructional approach by organizing smaller group sessions and incorporating more individualized scaffolding. This adaptation proved effective, as demonstrated by the Cycle II assessment results, which showed that 84.21% of students had reached the "developing as expected" or "very well developed" categories. The improvement was not only seen in test scores but also in classroom behavior, with students showing increased enthusiasm, better cooperation during tasks, and greater independence in recognizing and sequencing numbers. This progress emphasizes that the combination of visual media and structured pedagogy significantly enhances early numeracy skills.

The findings of this study are consistent with the research conducted by Suryana (2022), which concluded that picture-based number media improved students' ability to match numerical symbols with quantities and promoted better engagement. Similarly, Dewi and Putra (2022) reported that visual learning materials enhanced early numeracy comprehension and created a more positive learning atmosphere. These results are also in line with Piaget's cognitive development theory, which asserts that children in the preoperational stage need concrete and visual experiences to understand abstract concepts. Picture number cards serve precisely this function by bridging the gap between symbolic and real-world understanding. Moreover, from the perspective of Vygotsky's sociocultural theory, these media act as tools of mediation that facilitate learning through guided interaction and allow children to perform tasks they would not yet be able to do independently.

The improvement in children's numeracy skills as shown in this study also reflects the importance of teacher involvement in mediating learning through active observation and adaptation of strategies. It was not merely the media itself that led to success, but how it was introduced, scaffolded, and followed up through reflective practice. These findings support the approach of action research as a powerful method for continuous improvement in early childhood education. The structured cycles of planning, acting, observing, and reflecting enabled the researcher to make timely and responsive changes that aligned with the developmental needs of the students.

The results also highlight the inclusive and flexible nature of picture number card media, which proved effective for students with different learning styles. Children who initially exhibited minimal response in conventional lessons began participating actively once the media was introduced. Learning became more interactive and enjoyable, leading to higher motivation and deeper understanding. Such improvements align with Gardner's theory of multiple intelligences, which emphasizes the need to use varied modalities to reach learners effectively. In this case, visual and kinesthetic modalities were engaged simultaneously through the use of colorful, tangible materials that children could see, touch, and manipulate.

In summary, the use of picture number card media significantly enhanced children's ability to recognize and understand numbers 1–10. The integration of visual aids, when combined with reflective teaching practices, proved to be an effective strategy for promoting early numeracy. Furthermore, the findings demonstrate that even simple learning tools, when implemented thoughtfully, can have a powerful impact on young children's learning outcomes. These results contribute to the growing body of evidence supporting the use of media-assisted learning in early childhood education, particularly within the Indonesian PAUD context where instructional innovation remains essential to improving educational quality.

CONCLUSION

The results of this classroom action research confirm that the use of picture number card media significantly improves early childhood learners' ability to recognize and understand number concepts from 1 to 10. Through structured and iterative instructional interventions, children demonstrated measurable progress in cognitive development, classroom engagement, and independent learning behavior. This study contributes theoretically by reinforcing Piaget's and Vygotsky's developmental perspectives, which emphasize the importance of visual and interactive media in supporting symbolic understanding during the preoperational stage. Pedagogically, the findings underscore the role of media-assisted learning in enhancing early numeracy, particularly when integrated with responsive and reflective teaching practices.

The implications of this research extend to early childhood educators, curriculum designers, and educational policymakers. It emphasizes the need to adopt developmentally appropriate instructional tools that align with the characteristics of young learners. Simple, visual-based media such as picture number cards can serve as practical, low-cost strategies for improving learning outcomes in PAUD institutions across diverse educational contexts. Moreover, this research highlights the value of teacher-led innovation through classroom action research, where continuous reflection and adaptation lead to meaningful learning improvements.

Despite its contributions, the study has several limitations. It was conducted in a single classroom with a limited number of participants, which may affect the generalizability of the results. In addition, the intervention focused exclusively on number recognition and did not extend to broader mathematical competencies such as quantity comparison or problem-solving. Future research is recommended to explore the long-term effects of media-assisted learning on various aspects of early mathematics development, to test the approach across diverse settings and populations, and to incorporate digital or technology-enhanced versions of picture number cards for comparison. Such efforts can provide deeper insight into the scalability and sustainability of media-based instruction in early childhood education.

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