P-ISSN : 2502-8383
E-ISSN : 2808-3954
Vol. 11 No. 1, 2026

AL-ASHR:
Jurnal Pendidikan Dan Pembelajaran Dasar
Prodi PGMI-Fakultas Tarbiyah-UIJ

ENHANCING STUDENTS NUMERACY SKILLS THROUGH THE USE OF NUMBER CARD MEDIA IN MADRASAH IBTIDAIYAH

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Article Info

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Keywords:
number cards; numeracy skills; mathematics learning; numeration

Kata kunci:
kartu angka; keterampilan berhitung; pembelajaran matematika; numerasi

Naskah;
Diterima : 01/03/2026
Direvisi : 07/03/2026
Disetujui : 15/03/2026

Abstract

The development of numeracy skills is a crucial foundation in basic education. This study aims to describe the improvement of children's arithmetic skills through the use of number card media at MI Islamiyah Yosowilangun Kidul, Lumajang Regency. Employing a qualitative approach with a case study design, the research subjects consisted of two second-grade teachers and 37 students selected through purposive sampling. Data were collected through observation, interviews, and documentation, then analyzed using the Miles & Huberman model with source and technique triangulation applied to ensure data validity. The results indicate that number card media effectively helped 33 out of 37 students understand number concepts concretely, connect numeric symbols with real object quantities, and improve calculation accuracy in addition and subtraction operations involving numbers 1 to 50. This media also encouraged active participation, enthusiasm, and student confidence reflected in students' willingness to come to the front of the class, actively respond during learning activities, and sustain interest throughout the session. Supporting factors included the creativity of two second-grade teachers as well as whole-school support in the form of freedom to innovate, provision of facilities, and encouragement from the school principal. The main challenges were differences in students' arithmetic abilities in operations with larger numbers and limited time for individual guidance.

Abstrak

Pengembangan kemampuan berhitung merupakan fondasi penting dalam pendidikan dasar. Penelitian ini bertujuan mendeskripsikan peningkatan keterampilan berhitung anak melalui media kartu angka di MI Islamiyah Yosowilangun Kidul, Kabupaten Lumajang. Menggunakan pendekatan kualitatif dengan desain studi kasus, subjek penelitian meliputi dua guru kelas II dan 37 peserta didik yang dipilih secara purposive. Data dikumpulkan melalui observasi, wawancara, dan dokumentasi, lalu dianalisis menggunakan model Miles & Huberman dengan triangulasi sumber dan teknik sebagai uji keabsahan. Hasil penelitian menunjukkan bahwa media kartu angka efektif membantu 33 dari 37 siswa dalam memahami konsep bilangan secara konkret, menghubungkan simbol angka dengan jumlah benda, serta meningkatkan ketepatan berhitung pada operasi penjumlahan dan pengurangan bilangan 1 hingga 50. Media ini juga mendorong keterlibatan aktif, antusiasme, dan kepercayaan diri siswa yang terlihat dari keberanian maju ke depan kelas, aktif merespons, serta tidak mudah bosan selama pembelajaran. Faktor pendukung meliputi kreativitas dua guru kelas II serta dukungan sekolah berupa kebebasan berinovasi, penyediaan sarana prasarana, dan dorongan dari kepala sekolah. Hambatan utama adalah perbedaan kemampuan berhitung antarsiswa dalam operasi bilangan yang lebih besar dan keterbatasan waktu pendampingan individual.

INTRODUCTION

Primary education is a fundamental stage in shaping the quality of human resources for the future. At this level, students begin to develop various basic competencies that serve as the foundation for learning at higher levels. The success of primary education is not only measured by academic achievement, but also by the extent to which students are able to build a comprehensive and sustainable understanding of concepts (Widyanti, et al., 2025). Therefore, strengthening basic competencies from an early age is an aspect that cannot be overlooked in the provision of education (Sholihah, et al., 2019).

One of the basic competencies that plays an important role in students' academic development is numeracy. Numeracy is not merely concerned with calculation skills, but also encompasses the ability to understand number concepts, patterns, and quantitative relationships in various situations (Napitupulu et al., 2026). Mastery of numeracy in the early stages of primary school becomes the foundation for learning mathematics at more complex levels, thus requiring learning strategies that are appropriate to the characteristics of children's development (Asyura et al., 2026).

One of the fundamental competencies that needs to be instilled since primary education is numeracy skills, which not only form the basis of mathematics learning but also support daily life activities (Siregar & Adinda, 2025). Mathematics learning in primary school is directed toward forming logical, systematic, and critical thinking patterns (Arnidha & Fatahillah, 2012). However, empirical evidence shows that some lower-grade students still experience difficulties in understanding number concepts and applying simple arithmetic operations accurately (Saleh et al., 2026).

Theoretically, the cognitive development of primary school students is at the concrete operational stage, a phase in which children find it easier to understand concepts through direct experience and the use of real objects (Susanto, et al., 2024). According to Jean Piaget (1952), in this developmental phase, children are able to use logical reasoning when dealing with concrete objects, but their understanding of abstract concepts remains limited (Mulyan, 2024). Therefore, mathematics learning will be more effective when presented through concrete media that can be directly observed. The use of real media helps students build an understanding of number concepts gradually and meaningfully in accordance with the characteristics of their cognitive development (Mulyan, 2024).

Based on observations at MI Islamiyah Yosowilangun Kidul in the second grade class of 37 students, it was found that 10 students still had difficulty recognizing number symbols and

accurately determining the quantity of objects. This condition was influenced by limited reading fluency and suboptimal mastery of basic numeracy skills. Furthermore, the learning process, which was still dominated by teacher explanations and textbook exercises, resulted in relatively low student engagement, so that understanding of number concepts had not developed optimally. The impact was evident in the low numeracy skills, particularly in addition and subtraction material.

As an effort to address these problems, the teacher implemented number card media as a more concrete learning alternative suited to the characteristics of students at the concrete operational stage (Yulita, 2025). This media allows students to directly associate number symbols with quantities of objects through counting, grouping, and arranging numbers step by step. The use of concrete media has also been proven to increase student engagement and enthusiasm in learning, as well as supporting cognitive development in understanding abstract mathematical concepts (Andarsa et al., 2025).

Nevertheless, the use of number card media in Madrasah Ibtidaiyah also comes with its own set of challenges. The integration of general and religious curricula leaves relatively limited time available for mathematics learning. This condition requires both teachers and students to make the most of the available time so that learning objectives can still be achieved. Beyond time constraints, the availability of adequate learning media particularly in madrasah located in rural areas remains a challenge in itself. On the other hand, the diverse cognitive abilities of students within a single classroom require teachers to be more creative and flexible in managing instruction, ensuring that every student remains engaged and can follow the learning process according to their individual capacity (Trisnani et al., 2024).

In such circumstances, number card media can serve as a fairly relevant and practical alternative. This media is simple, easy to prepare, and can be used flexibly even within limited instructional time, without requiring significant costs. Despite its simplicity, number cards are capable of providing students with a more tangible learning experience for instance, when they practice counting, recognize number symbols, and perform basic arithmetic operations directly. For this reason, number card media not only helps address limitations in time and resources, but can also serve as an effective strategy for strengthening students' arithmetic foundations, particularly in the lower grades of Madrasah Ibtidaiyah.

Based on the foregoing, this study focuses on three main aspects: efforts to improve students' numeracy skills, the application of number card media in the learning process, and the factors that support and hinder its implementation. Thus, this study not only examines learning outcomes, but

also comprehensively investigates the dynamics of numeracy learning using number card media in Madrasah Ibtidaiyah.

RESEARCH METHODS

This study employs a qualitative approach with a case study design as proposed by John W. Creswell (2018), aimed at obtaining a deep and comprehensive understanding of a phenomenon within the real context being studied (John W. Creswell & Cheryl N. Poth, 2018). This approach was chosen to thoroughly examine numeracy learning using number card media and number flash cards among second-grade students at Madrasah Ibtidaiyah. The research focus was directed at the process of media use in learning, the level of student engagement, and the factors influencing the implementation of numeracy learning. The study was conducted at MI Islamiyah Yosowilangun Kidul, Lumajang Regency, with research subjects comprising the second-grade teacher and second-grade students selected purposively due to their direct involvement in numeracy learning activities.

Data collection techniques included observation to obtain an overview of learning conditions in the field, interviews with the school principal, the vice principal for curriculum affairs, the second-grade teacher, and second-grade students, as well as documentation to gather data related to the learning process and student outcomes. The research subjects consisted of 37 second-grade students, comprising 19 students from class II A and 18 students from class II B. The selection of second grade was based on the consideration that students at this level are in the early stages of mastering number concepts and basic arithmetic operations, making them the most relevant target for the application of number card media as a concrete learning medium. Data analysis was conducted descriptively and qualitatively through the stages of data reduction, data display, and conclusion drawing (Miles & Huberman 2014). The analysis process was carried out systematically by examining interview data, field notes, and documentation. Data validity was maintained through source triangulation and technique triangulation, namely by comparing the results of observation, interviews, and documentation so that the data obtained were trustworthy and accurately represented the learning conditions (Sugiyono, 2019).

RESEARCH RESULTS AND DISCUSSION

This study aims to comprehensively describe the process of improving students' numeracy skills through the use of number card media in mathematics learning at the Madrasah Ibtidaiyah level. The findings of this study were formulated based on data collected through observation activities during the learning process, interviews with the school principal, teachers, and students, and supported by documents relevant to the conduct of the research. The presentation of research findings is focused on those relevant to the research questions previously established.

Efforts to Improve Children's Numeracy Skills through Number Card Media

Based on findings obtained through observation activities in the second grade class at MI Islamiyah Yosowilangun Kidul, the teacher made various efforts to improve students' numeracy skills by utilizing number card media as the primary tool in learning. This media was used to help students understand the concept of quantity more concretely, making it easier to comprehend.

In practice, the teacher began the lesson by showing number cards accompanied by pictures of objects to the students. Students were asked to observe the pictures and then state the number of objects on the card. This activity aimed to train students' ability to recognize quantities while connecting them to the corresponding number symbols. Observation results showed that most students were able to pay attention to the media well and could accurately state the number of objects. Compared to learning without media, students appeared more focused and enthusiastic when number cards were used.

In addition to observation activities, the teacher also invited students to practice counting directly, both using objects demonstrated by the teacher and objects held by the students themselves. Students counted one by one while pointing to the objects being counted. This process helped them understand the correct counting procedure while also training accuracy in determining quantities. Although some students still required guidance, numeracy skills generally showed positive development following the consistent use of number card media. These findings were reinforced by interview results with the second-grade teacher, who stated that prior to media use, some students frequently made errors and lacked confidence. After the media was used consistently, students became more focused, more willing to try, and their calculation results became increasingly accurate. More specifically, of the total 37 students, 13 students who had previously experienced difficulty in recognizing number symbols showed positive development after number card-based learning was implemented consistently. Overall, 33 out of 37 students

demonstrated a solid understanding of number concepts, the ability to connect numeric symbols with real object quantities, and improved accuracy in performing addition and subtraction operations involving numbers 1 to 50. To clarify the findings, the following table presents a summary of observation results:

Table 1. Observation Findings of the Use of Number Card Media

Observed Aspects	Classroom Findings	Meaning of the Concept of Things
Use of number cards	The teacher shows cards containing numbers and pictures of objects.	Objects help students understand quantity in a concrete way.
Observing the picture	Students observe and then name many objects	Students learn to connect objects with number symbols.
Count directly	Students count one by one while pointing	Practice correct counting procedures
Student response	Students are more focused and enthusiastic	Media makes learning more interesting
Learning outcomes	More accurate student count	Understanding of counting begins to increase

Source: Institutional Observation

Based on the table, it is evident that the use of number cards does not merely function as a visual aid, but also as a concrete tool that facilitates the gradual understanding of number concepts. This media helps students build a more meaningful connection between number symbols and the representation of object quantities.

These findings support the results of Rezeky et al. (2025), which demonstrated that the use of number cards proved effective in improving the numeracy skills of lower-grade students, particularly in number recognition and basic arithmetic operations (Rezeky & Ramadhaini, 2025). In line with this, Handina et al. (2023) reported significant improvements in students' number recognition and counting accuracy following the implementation of number card media, confirming the relevance of this study's findings (Handina et al., 2023). A number of previous studies have consistently shown that the use of number card media contributes positively to improving early numeracy skills among primary school students. The findings of Handina et al. (2023) revealed improvements in number recognition, counting accuracy, and learning motivation following the use of number card media in mathematics learning (Handina et al., 2023). In addition, card media packaged in the form of games was considered effective in making abstract

mathematical concepts more concrete and easier for students to understand (Rezeky & Ramadhaini, 2025). These findings reinforce the urgency of using number card media as a relevant learning strategy in Madrasah Ibtidaiyah. Theoretically, the use of number cards is also consistent with Jean Piaget's (1971) cognitive development theory, which explains that primary school-aged children are in the concrete operational phase (Zulminiati et al., 2025). In the concrete operational phase, students tend to grasp concepts more easily when presented through objects or media that can be directly observed (Karimah et al., 2025).

In the context of this study, number cards serve as a bridge between number symbols and object quantities, thereby helping students build a more systematic conceptual understanding. Beyond its impact on the cognitive aspect, the use of number card media also influences students' learning motivation, particularly intrinsic motivation in participating in mathematics learning. Students appeared more enthusiastic when matching number cards with object quantities, more willing to attempt answering addition and subtraction problems in front of the class, and less prone to boredom during number symbol recognition activities, as learning took place through paired card games, arranging number sequences, and mini counting games. It can therefore be concluded that the use of number card media not only improves students' counting accuracy, but also deepens their understanding of number concepts and encourages active participation and interest in mathematics learning at Madrasah Ibtidaiyah.

The Use of Number Card Media in Numeracy Learning

The implementation of numeracy learning using number card media at Madrasah Ibtidaiyah was carried out in a planned manner and adapted to the characteristics of second-grade students. Based on observation results, the teacher used number cards as the primary medium for introducing number symbols, training the ability to count object quantities, and progressively strengthening the understanding of number concepts. The understanding of number concepts referred to here encompasses students' ability to recognize and read number symbols from 1 to 50, understand the place value of ones and tens, connect number symbols with the actual quantity of objects concretely, and understand the order of numbers from smallest to largest. Through number cards, students were trained not merely to memorize numbers, but to genuinely understand the meaning of numbers in a real context.

In the initial stage of learning number symbol recognition and place value concepts, the teacher introduced number cards by showing them to students in turn. Students were asked to state

the number shown on the card and count the corresponding number of objects. This activity was conducted as a whole-class activity so that all students could follow the learning process together and receive equal learning opportunities. Through this activity, students began to understand the connection between number symbols and the representation of object quantities more concretely.

Subsequently, the teacher demonstrated the correct counting method, namely counting objects one by one in an orderly and consistent manner. Students were then asked to replicate the demonstrated steps, both individually and collectively. Based on observation results, the majority of students were able to follow the counting steps well, although some still required additional guidance. To increase learning variety, the teacher also combined the use of number cards with simple activities, such as arranging numbers in sequence and matching number cards with the corresponding number of objects. This variety of activities made learning more engaging and less monotonous, so that students appeared more active and showed high interest throughout the process.

Figure 1: Counting activity

Figure 2: Number card media

Interview results with students indicated that they enjoyed learning numeracy using number card media. Students expressed that counting activities became easier to understand and felt like playing. Furthermore, students became more confident in performing activities in front of the class and engaging in counting activities with their peers.

These findings demonstrate that the application of number cards helped students grasp number concepts concretely while also encouraging active student engagement in learning activities. This result is consistent with the research of Rezeky & Ramadhaini (2025), which found that the use of flash cards can help students understand numbers through real visual presentation (Rezeky & Ramadhaini, 2025). The presentation of number symbols accompanied by pictorial

representations provides a more meaningful learning experience compared to purely verbal instruction (Rostika et al., 2026).

In the learning process, students' direct involvement through one-by-one counting activities strengthened their procedural understanding (Muna & Prayoga, 2024). This demonstrates that the use of number card media can improve numeracy skills through visual and participatory learning activities (Fauziah, et al., 2025). In the context of this study, number cards function as a concrete medium that helps students connect visual experiences with number symbols, so that the concept of counting is not understood in a purely abstract manner.

In addition to supporting the cognitive aspect, the use of number cards also creates active and constructive learning. All second-grade students were involved in various activities such as arranging cards, matching object quantities, and performing direct calculations. Learning that prioritizes active student engagement reflects alignment with the principles of participatory learning, which emphasizes the active role of students in constructing understanding (Masrukhin et al., 2024). Research by Amalia (2025) showed that the use of flash cards as a learning medium can effectively support improvements in both numeracy skills and students' cognitive abilities due to direct involvement in the learning process (Amalia, 2025).

Based on interview results, a learning atmosphere packaged to resemble play made students feel more comfortable, confident, and motivated to actively engage in counting activities. This condition indicates that the use of number card media has an impact that extends beyond improving cognitive numeracy skills, also contributing to the growth of student motivation and activeness throughout the learning process.

Supporting and Inhibiting Factors in the Use of Number Card Media

The integration of number card media to support numeracy skills learning at MI Islamiyah Yosowilangun Kidul was influenced by a number of factors that both supported and hindered its implementation in the classroom. Based on the research findings, these factors can be summarized as follows.

Table 2: Supporting Factors

Supporting factors	Description
School support	Schools give teachers the freedom to innovate in the use of learning media.
Teacher creativity	Teachers are able to package learning using number cards in an interesting way.
Student response	Students are enthusiastic, active, and more focused during learning.

Source: Field Findings

Table 3: Inhibiting Factors

Inhibiting Factors	Description
Differences in student abilities	Some students still have difficulty calculating larger numbers.
Time constraints	Teachers have difficulty providing equal support to all students.

Source: Field Findings

Based on these data, it is evident that institutional support is the primary factor contributing to the successful use of number card media. The school provides space for teachers to develop learning according to students' needs, including in the selection and utilization of relevant media. This policy aligns with the principles of the Merdeka Curriculum, which emphasizes student-centered learning and the use of contextual media appropriate to students' developmental stages (tasya, 2025). Such support enables teachers to innovate more freely and adapt learning strategies to actual classroom conditions.

Beyond school support, teacher creativity is an important factor in determining the effectiveness of media use. The teacher not only displayed number cards, but also connected them with counting activities involving objects around the classroom. Through this approach, students did not merely recognize number symbols, but understood their connection to quantities in a real context (Sufa, 2022). From the students' perspective, the positive responses demonstrated during learning further reinforced the effectiveness of number card media use. Students appeared more enthusiastic and active when learning involved visual media compared to lecture-only methods. The classroom atmosphere became more interactive, marked by students actively discussing with seatmates while arranging number card sequences, competing to answer when the teacher held up a card and asked students to state its value, and eagerly coming to the front of the class to match number cards with the available objects. The findings of Athoillah et al (2025) also affirmed that flash cards are effective in helping students recognize numbers in the early stages of primary education, so their application in the second grade of MI Islamiyah Yosowilangun Kidul is consistent with children's cognitive developmental patterns (Athoillah et al., 2025).

Nevertheless, field implementation was not without obstacles. Differences in students' numeracy abilities presented a particular challenge. Within a single class, some students demonstrated a faster ability to grasp material, while others required repetition and more intensive guidance. Of the total 37 students, approximately 10 still required more intensive support,

particularly in addition and subtraction operations involving larger numbers. This condition indicates that each student has a different learning pace and style, requiring teachers to adapt the form of guidance to each student's individual needs (Asnawi et al., 2023).

In addition, time constraints in learning also affected the optimization of media use. The teacher had to divide time between delivering material, providing examples, and accompanying students experiencing difficulties. Wasiyah (2023) affirmed that the effectiveness of learning media is greatly influenced by time management and the intensity of teacher guidance in the classroom (Wasiyah et al., 2023). Thus, although number cards have great potential in supporting the understanding of number concepts, their success remains dependent on the learning management strategies applied (Johar & Hanum, 2021).

Overall, the use of number card media at MI Islamiyah Yosowilangun Kidul made a positive contribution to numeracy learning. This media facilitated students in understanding number concepts concretely, encouraged active participation during learning, and created a more dynamic and enjoyable classroom environment. Although obstacles existed in the form of differences in student ability and time constraints, the available supporting factors particularly school support and teacher creativity rendered the use of number cards consistently effective in improving the numeracy skills of second-grade students.

CONCLUSSION

Based on the research findings and discussion, it can be concluded that the low numeracy skills of second-grade students at MI Islamiyah Yosowilangun Kidul, caused by the dominance of lecture-based methods and minimal use of concrete media, served as the background for the implementation of number card media in mathematics learning. This is consistent with Jean Piaget's cognitive development theory, which states that primary school-aged children are in the concrete operational stage, so that learning will be more effective when presented through real media that can be directly observed and manipulated by students.

The use of number card media has been proven effective in improving students' numeracy skills, as evidenced by students' ability to recognize number symbols from 1 to 50, understand the place value of ones and tens, count object quantities in sequence, and match numbers with the correct quantities. Learning was implemented gradually through classical, group, and individual activities so that all students could be actively engaged. A learning atmosphere packaged to resemble play also made students more focused, more willing to try, and less prone to boredom.

Supporting factors for success included teacher creativity, school support, and student enthusiasm, while inhibiting factors consisted of differences in students' numeracy abilities and limited guidance time. Nevertheless, number card media has proven to be an effective learning alternative for improving the numeracy skills of lower-grade students at Madrasah Ibtidaiyah.

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