

## **Improving Arabic Letter Recognition through Flashcard-Based Instruction: Classroom Action Research with Indonesian First-Grade Students**

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### **Abstract:**

Early-grade students struggle to recognize Arabic letters when instruction relies on verbal explanation and repetitive boardwork. This problem is important because Arabic letter recognition provides a foundation for reading the Qur'an and participating in primary Islamic education. Visual learning perspectives suggest that concrete, engaging media can support memory, attention, and active participation among children at the concrete operational stage. This study investigated how flashcard-based instruction improved Arabic letter recognition and classroom participation among first-grade students at SDN Senden 2, Indonesia. This classroom action research, following the Kemmis and McTaggart model, involved 20 students during the 2024/2025 academic year. The intervention comprised two cycles of planning, action, observation, and reflection. Data were collected through achievement tests, classroom observations, and field notes, then analyzed using mean scores, mastery percentages, and qualitative reflection. The mean score increased from 61.75 in the pre-cycle stage to 69.25 in Cycle I and 80.25 in Cycle II. Learning mastery rose from 20% to 65% and then to 95%, while observations showed greater participation, confidence, and classroom engagement. These findings indicate that progressively refined flashcard activities can support Arabic letter learning. Primary teachers should combine structured turns, small-group activities, visual variation, and targeted assistance when applying this strategy.

**Keywords:** Arabic letter recognition; flashcard-based instruction; classroom action research; learning mastery; classroom participation

### **Abstrak:**

Siswa kelas awal sering mengalami kesulitan mengenali huruf hijaiyah ketika pembelajaran bertumpu pada penjelasan verbal dan pengulangan melalui papan tulis. Persoalan ini penting karena pengenalan huruf hijaiyah menjadi landasan untuk membaca Al-Qur'an dan mengikuti pembelajaran Pendidikan Agama Islam di sekolah dasar. Perspektif pembelajaran visual menunjukkan bahwa media konkret dan menarik dapat mendukung daya ingat, perhatian, serta partisipasi aktif anak pada tahap operasional konkret. Penelitian ini bertujuan menjelaskan peningkatan kemampuan mengenali huruf hijaiyah dan partisipasi kelas melalui pembelajaran berbasis flashcard pada siswa kelas I SDN Senden 2, Indonesia. Penelitian tindakan kelas mengikuti model Kemmis dan McTaggart dengan melibatkan 20 siswa pada tahun pelajaran 2024/2025. Tindakan dilaksanakan dalam dua siklus yang mencakup perencanaan, pelaksanaan, observasi, dan refleksi. Data dikumpulkan melalui tes hasil belajar, observasi kelas, dan catatan lapangan, kemudian dianalisis menggunakan nilai rata-rata, persentase ketuntasan, dan refleksi kualitatif. Nilai rata-rata meningkat dari 61,75 pada pra-siklus menjadi 69,25 pada Siklus I dan 80,25 pada Siklus II. Ketuntasan belajar meningkat dari 20% menjadi 65% dan mencapai 95%, sedangkan observasi menunjukkan peningkatan partisipasi, kepercayaan diri, dan keterlibatan siswa. Temuan menunjukkan bahwa penyempurnaan aktivitas flashcard secara bertahap mendukung pembelajaran huruf hijaiyah. Guru sekolah dasar disarankan untuk memadukan giliran terstruktur, kelompok kecil, variasi visual, dan pendampingan individual yang terarah.

**Kata kunci:** pengenalan huruf hijaiyah; pembelajaran berbasis flashcard; penelitian tindakan kelas; ketuntasan belajar; partisipasi kelas

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## INTRODUCTION

Difficulty recognizing hijaiyah letters remains a crucial problem because it restricts children's initial access to Qur'anic literacy. Mastery of these symbols precedes accurate pronunciation and reading. The problem persists when verbal explanation and board writing offer few opportunities for active recall. Studies report ongoing difficulty identifying, distinguishing, and pronouncing hijaiyah letters among young learners who need concrete visual support (Ela Fitri Dwiriani et al., 2025; Imas Marisa et al., 2022). Card-based interventions therefore connect visible letter forms with spoken responses through matching and guided practice (Imas Marisa et al., 2022; Syahrani et al., 2026). At SDN Senden 2, the preliminary assessment produced a mean of 61.75, with only 20% reaching mastery. This condition requires structured repetition and assessment-guided adjustment, not merely the introduction of visual media.

Research presents flashcards as useful media for hijaiyah recognition, but the evidence remains fragmented across settings and outcomes. Most studies determine whether performance improves, without explaining how teachers revise instruction when mastery is uneven. Many examine preschool, kindergarten, Qur'anic centers, or learners with specific difficulties rather than first-grade public-school classrooms. Context-specific studies report increased interest and recognition after exposure to colorful cards, but their small samples limit measurement of individual achievement (Ela Fitri Dwiriani et al., 2025; Syahrani et al., 2026). Other studies identify gains in reading or memory but summarize outcomes mainly through aggregate percentages (Ela Fitri Dwiriani et al., 2025; Imas Marisa et al., 2022). Researchers rarely present anonymized student-level progression across a baseline and two reflective cycles. Research must therefore

connect individual score distributions, instructional revision, and classroom mastery within one documented process.

Flashcards can support learning when they require students to retrieve from memory rather than view the same information. Active retrieval strengthens access to stored associations because learners must connect a cue with a response. Feedback then corrects inaccurate recall before the error becomes stable. In authentic elementary classrooms, flashcard-based retrieval has produced stronger short-term and delayed performance than restudy or oral repetition (Franzoi et al., 2025; Ophuis-Cox et al., 2023). Similar benefits have been observed among preschool children when repeated practice first establishes sufficient retrieval success (Káldi et al., 2025). More learning rounds can also increase the retrieval-practice effect in flashcard vocabulary tasks (Huang et al., 2025). These findings indicate that hijaiyah flashcards should be organized as repeated recall, pronunciation, and feedback activities rather than simple visual presentation.

Visual support does not automatically improve memory because its effect depends on task design. Images may attract attention, but cues revealing answers reduce the effort required for retrieval. Young learners also differ in attention, prior knowledge, and the need for successful practice. Classroom experiments show that retrieval practice improves learning, although attention and task structure influence its benefit (Franzoi et al., 2025; Káldi et al., 2025). Answer-revealing images can weaken later vocabulary recall when presented before a retrieval attempt (Van Den Broek et al., 2021). Hijaiyah studies likewise emphasize guided interaction, repetition, and developmentally appropriate card design (Ela Fitri Dwiriani et al., 2025; Syahrani et al., 2026). Flashcard instruction therefore requires continuous adaptation based on observed participation and individual assessment results during classroom practice.

This study examines how flashcard instruction improves first-grade students' hijaiyah letter recognition through classroom action research. The objective addresses limited evidence from Indonesian public primary schools and the frequent reliance on aggregate percentages. It also connects learning outcomes with revisions after each assessment stage. The study first establishes baseline learning conditions by reporting anonymized individual scores, the class mean, and

the proportion meeting the mastery criterion. It then evaluates initial improvement during Cycle I and identifies the score distribution that remains near or below the required threshold. Finally, it examines consolidated improvement during Cycle II after revising grouping, guided questioning, practice, reinforcement, and support for students who had not reached mastery. This sequence explains not only whether achievement changed, but how assessment-informed adjustments accompanied that change.

Flashcard instruction is expected to improve hijaiyah letter recognition when visual cues prompt repeated retrieval, feedback, and revision. Repeated identification and pronunciation should strengthen connections between letter forms and verbal labels. Reflection should help the teacher target students and symbols that are difficult. Retrieval studies predict stronger performance when learners recall information across several practice rounds rather than reviewing it only once. Evidence involving children indicates that retrieval success also depends on initial learning and sustained attention. Formative assessment research associates monitoring and instructional adjustment with better achievement than feedback without follow-up action. Mastery should rise across cycles, while unresolved difficulty becomes limited to fewer students.

## **METHOD**

The unit of analysis was a first-grade classroom at SDN Senden 2, with each student treated as an embedded unit for tracking achievement. This focus was appropriate because the study examined how flashcard-based instruction changed a shared classroom process rather than isolated behavior outside instruction. Individual-level tracking was retained because class averages alone could conceal differences in student mastery. The unit comprised 20 students enrolled during the 2024/2025 academic year, and their learning activities involved recognizing and pronouncing hijaiyah letters. The classroom was selected purposively after the preliminary assessment identified low achievement under conventional teacher-centered instruction. The study followed students consistently from the pre-cycle assessment through Cycles I and II, and used anonymous codes S01 to S20 in all tables to protect confidentiality.

The study employed classroom action research using qualitative and descriptive quantitative evidence. This design was selected because the research aimed to improve an instructional problem while documenting how teaching adjustments influenced classroom participation. Combining observational evidence with achievement scores was necessary to capture both implementation processes and measurable changes in mastery. The study followed the Kemmis and McTaggart cycle of planning, action, observation, and reflection, a structure that supports iterative instructional revision (Rabgay & Kidman, 2023). The study conducted two cycles, each lasting two weeks, using reflection from the preceding stage to refine grouping, time allocation, flashcard presentation, and teacher support. Quantitative comparisons were embedded within the action research process to supplement qualitative interpretation rather than establish causal effects or population-level generalization (Moyo et al., 2022).

Data were obtained from 20 students, the classroom teacher, the collaborating observer, and instructional records. Multiple sources were required because achievement scores described learning outcomes but could not independently explain participation, confidence, or implementation problems. Combining performance and observational data also allowed each cycle's reflection to be based on converging classroom evidence. Quantitative data consisted of individual scores from the pre-cycle test and the formative tests administered at the end of Cycles I and II. Qualitative data comprised structured observation sheets, field notes, teacher reflections, and supporting instructional documents, including lesson plans, worksheets, flashcards, and assessment records. These sources were organized by research stage and student code, enabling cross-cycle comparisons while preserving participant confidentiality and supporting systematic, data-informed practice modification (Aras, 2024; Torun & Pektaş, 2025).

Data collection followed a sequence from baseline assessment to intervention, observation, formative testing, and reflection. This sequence established initial conditions before assessing changes within each cycle. Repeated collection was necessary because evidence from each cycle determined subsequent instructional revisions. Before Cycle I, students completed a test on identifying and pronouncing hijaiyah letters, while the teacher documented the prevailing

instructional conditions. During both cycles, the teacher used flashcard games, guided questioning, group practice, and individual exercises, while the collaborator recorded participation, responses, confidence, and classroom management in observation sheets and field notes. Each cycle ended with a formative test and reflective discussion, after which the evidence was checked across tests, observations, and records to guide subsequent action (Aras, 2024; Torun & Pektaş, 2025).

Data analysis combined descriptive quantitative calculations with qualitative descriptive comparison across the three research stages. This approach was needed to assess mastery improvement and explain implementation changes across cycles. Separate analyses prevented numerical and observational evidence from being treated as interchangeable. Individual scores were tabulated, summed, and divided by 20 to calculate the class mean, while mastery percentages were calculated using a minimum criterion of 70% and a target of at least 75% classroom mastery. We organized observation sheets and field notes by cycle, reduced them into recurring categories such as participation, confidence, response accuracy, and classroom management, and compared them during reflection. We then integrated the two strands chronologically to assess convergence, identify remaining learning needs, and determine whether another cycle was required (Moyo et al., 2022; Torun & Pektaş, 2025).

## **RESULTS AND DISCUSSION**

### **Baseline Learning Conditions Before the Intervention**

Before the intervention, Arabic letter instruction in the first-grade classroom relied on teacher explanation, verbal repetition, and writing on the board. Students were expected to identify and distinguish hijaiyah letters without visual media or learning games. Classroom observations showed that students had difficulty maintaining attention, responding confidently, and recalling letter forms during learning activities. The teacher had limited opportunities to involve every student in active practice because instruction was conducted with the whole class. To establish the starting condition, the researcher administered an assessment to all 20 students using the same minimum mastery criterion applied in the following

cycles. The results provided a baseline for identifying the scale of the learning problem and determining the changes required in Cycle I.

Table 1. Learning Outcomes in the Pre-Cycle Stage

| <b>Indicator</b>               | <b>Result</b> |
|--------------------------------|---------------|
| Number of students             | 20            |
| Minimum mastery criterion      | 70            |
| Mean score                     | 61.75         |
| Students achieving mastery     | 4             |
| Students not achieving mastery | 16            |
| Mastery percentage             | 20%           |

Table 1 presents the students' baseline learning outcomes before flashcard-based instruction was introduced. The 20 participating students earned a mean score of 61.75, 8.25 points below the minimum mastery criterion of 70. Only four students met the required score, while 16 remained below the criterion. Consequently, the classroom mastery rate was limited to 20%, far below the predetermined success criterion of 75%. These baseline results show that most students had not yet achieved the expected level of Arabic letter recognition and therefore provided the empirical basis for implementing the first cycle of flashcard-based instruction.

The pre-cycle pattern indicates that low achievement was a class-level issue rather than an isolated problem involving a few students. The gap between the mastery rate and the 75% success criterion was 55 percentage points. With 20 participants, the class needed at least 15 students to reach mastery, meaning that 11 students had to meet the criterion before the intervention could be considered successful. The data also indicate variation in ability because a small group had already reached the required standard while most students had not. Therefore, Cycle I needed to address two conditions: widespread difficulty in recognizing Arabic letters and differences in students' starting competence. These conditions supported using visual repetition, structured participation, and guided practice as components of the flashcard-based intervention.

The pre-cycle result shows that instruction did not adequately support recognition of Arabic letter forms. Verbal explanation and boardwork provided few opportunities to examine visual differences. Cognitive Theory of Multimedia

Learning explains this condition through verbal and visual channels; instruction that does not coordinate both channels can restrict meaningful learning (Mayer, 2024; Noetel et al., 2022). This explanation matters because beginning readers need practice identifying, distinguishing, and connecting written symbols with their sounds when learning a new script (Abu Ahmad & Share, 2025; Usiono et al., 2021). In the historical and religious context of primary Islamic education, hijaiyah recognition is the entry point to Qur’anic reading and participation in communal religious learning. Thus, the result represents both a cognitive learning problem and restricted access to foundational religious literacy.

**Initial Improvement in Learning Outcomes During Cycle I**

Cycle I introduced flashcard-based instruction to address the low recognition of hijaiyah letters identified before the intervention. The intervention was conducted in two meetings. During the first meeting, the teacher presented letter cards through group games and quizzes, allowing students to identify and pronounce letters in turn. The second meeting emphasized reinforcement through exercises and a formative test. Classroom observation showed higher participation and interest than in the previous teacher-centered lessons, although several students remained hesitant and the group activities were not yet well organized. The end-of-cycle assessment showed an initial improvement in learning outcomes, but the predetermined mastery target had not been achieved. These findings became the basis for revising the instruction in Cycle II.

Table 2. Individual Learning Outcomes in Cycle I

| <b>Student code</b> | <b>Score</b> | <b>Mastery status</b> |
|---------------------|--------------|-----------------------|
| S01                 | 70           | Achieved              |
| S02                 | 65           | Not achieved          |
| S03                 | 80           | Achieved              |
| S04                 | 70           | Achieved              |
| S05                 | 60           | Not achieved          |
| S06                 | 70           | Achieved              |
| S07                 | 65           | Not achieved          |
| S08                 | 75           | Achieved              |
| S09                 | 80           | Achieved              |
| S10                 | 55           | Not achieved          |
| S11                 | 75           | Achieved              |
| S12                 | 70           | Achieved              |

|                   |                    |              |
|-------------------|--------------------|--------------|
| S13               | 65                 | Not achieved |
| S14               | 70                 | Achieved     |
| S15               | 75                 | Achieved     |
| S16               | 70                 | Achieved     |
| S17               | 85                 | Achieved     |
| S18               | 65                 | Not achieved |
| S19               | 60                 | Not achieved |
| S20               | 70                 | Achieved     |
| <b>Mean score</b> | <b>69.25</b>       |              |
| <b>Mastery</b>    | <b>13 students</b> | <b>65%</b>   |

Table 2 reports individual achievement scores from the first cycle of flashcard-based instruction. Scores ranged from 55 to 85, with S17 recording the highest result and S10 the lowest. Of the 20 students, 13 met the minimum mastery criterion of 70, the remaining seven scored below it. This produced a classroom mastery rate of 65%. The class mean reached 69.25, only 0.75 points below the required score. Most students who achieved mastery scored between 70 and 80, while students below mastery scored between 55 and 65. Although the table shows that a majority met the criterion, the result did not yet meet the study's success requirement, which specified that at least 75% of students should achieve learning mastery.

The dominant pattern in Cycle I was a concentration of scores around the minimum mastery criterion. Eleven of the 20 students scored 65 or 70, placing 55% of the class within five points of the cutoff. Among the 13 students classified as achieving mastery, seven received exactly 70, while only six exceeded the criterion. The upper end of the distribution was small. Two students scored 80 and one scored 85. A similar concentration appeared below the cutoff, where four of the seven non-mastered students scored 65. Only three students were further below, with scores of 55 or 60. Therefore, the data show a pattern of minimum-level mastery rather than consistently high achievement. Cycle I produced a clustered pattern near the threshold, with limited separation between the mastered and non-mastered groups.

The Cycle I pattern indicates that flashcards helped students begin recognizing letters, but many had not developed stable recall. Retrieval practice theory explains this result: flashcards strengthen memory when learners retrieve answers rather than only view information. More practice rounds strengthen

retrieval, while pictures that reveal the answer may reduce retention by reducing recall effort (Huang et al., 2025; Van Den Broek et al., 2021). Scores near the mastery criterion therefore indicate that recognition has begun but requires further independent practice. From a formative assessment perspective, these scores identify which students and letter forms need additional instruction. Using the results to plan Cycle II is consistent with research showing that progression-based assessment and specific, actionable feedback support instructional decisions and learning improvement (Brandmo & Gamlem, 2025; Harris et al., 2022).

### Consolidated Learning Improvement During Cycle II

Table 3. Individual Learning Outcomes in Cycle II

| <b>Student code</b> | <b>Score</b>       | <b>Mastery status</b> |
|---------------------|--------------------|-----------------------|
| S01                 | 80                 | Achieved              |
| S02                 | 75                 | Achieved              |
| S03                 | 90                 | Achieved              |
| S04                 | 80                 | Achieved              |
| S05                 | 75                 | Achieved              |
| S06                 | 85                 | Achieved              |
| S07                 | 80                 | Achieved              |
| S08                 | 85                 | Achieved              |
| S09                 | 90                 | Achieved              |
| S10                 | 70                 | Achieved              |
| S11                 | 85                 | Achieved              |
| S12                 | 75                 | Achieved              |
| S13                 | 80                 | Achieved              |
| S14                 | 80                 | Achieved              |
| S15                 | 90                 | Achieved              |
| S16                 | 80                 | Achieved              |
| S17                 | 95                 | Achieved              |
| S18                 | 70                 | Achieved              |
| S19                 | 65                 | Not achieved          |
| S20                 | 85                 | Achieved              |
| <b>Mean score</b>   | <b>80.25</b>       |                       |
| <b>Mastery</b>      | <b>19 students</b> | <b>95%</b>            |

Table 3 presents the individual learning outcomes of 20 students following the revised flashcard-based instruction in Cycle II. Student identities are reported using anonymous codes from S01 to S20 to protect participant confidentiality. Scores ranged from 65 to 95. Nineteen students met the minimum mastery criterion

of 70, whereas one student, S19, scored 65. S17 obtained the highest score, 95. Three students scored 90, four scored 85, six scored 80, three scored 75, and two scored exactly 70. Based on the total score of 1,605, the class mean was 80.25. Consequently, the proportion of students achieving mastery reached 95%, while the non-mastery rate was limited to 5% at the end of Cycle II.

The score distribution in Cycle II shows a concentration in the upper-middle range rather than around the mastery threshold. Thirteen students, or 65% of the class, scored between 80 and 90, making this interval the dominant range. Six students scored 80, the most frequent score, while four reached 85 and three obtained 90. At the lower end, only three students remained close to the threshold: two scored 70, and one scored 65. The distribution leaned toward higher scores, with relatively few students in the minimum and below-minimum categories. Low achievement also narrowed, since no student scored below 65. Nevertheless, the single score of 65 indicates that improvement was not completely uniform across the class and that one learner still required targeted support.

The concentration of Cycle II scores above 80 suggests that revised flashcard activities supported stable recognition of hijaiyah letters. In retrieval practice theory, repeated attempts to recall visual forms and verbal labels strengthen access to stored information, while feedback corrects unsuccessful retrieval (Franzoi et al., 2025; Káldi et al., 2025; Ophuis-Cox et al., 2023). This matters because students repeatedly identified and pronounced the letters rather than merely observing them. The 95% mastery rate therefore reflects broader access to the material after structured repetition, guided questioning, and reinforcement. However, the remaining score below the mastery criterion indicates that retrieval benefits depend on sufficient success and learner readiness. Formative assessment should identify specific letter confusions and guide focused practice for the remaining learner (Karaman, 2021; Yan & Chiu, 2023).

## **CONCLUSION**

Structured and responsive flashcard use produced meaningful gains in early hijaiyah letter recognition. Repeated practice enabled young learners to connect visual letter forms with accurate pronunciation. Assessment-guided

adjustments also allowed the teacher to address uneven mastery across the class. Before the intervention, the class mean was 61.75, and only 20% of students met the minimum mastery criterion. After Cycle I, the mean increased to 69.25 and mastery reached 65%, indicating progress that remained below the target. Following revised grouping, guided questioning, reinforcement, and focused assistance in Cycle II, the mean rose to 80.25 and mastery reached 95%. These results show that simple instructional media support substantial progress when teachers evaluate their implementation and adapt activities to students' identified learning needs.

Individual scores across three assessment stages provide traceable evidence of how learning changed during flashcard-based instruction. Individual-level reporting prevents classroom averages from concealing differences in student achievement. The cyclical design further connects assessment results with specific instructional revisions. Data from the pre-cycle stage, Cycle I, and Cycle II record the progression of mean scores and mastery rates. Score distributions show movement from widespread non-mastery toward a concentration between 80 and 90, although one student remained below the criterion. The findings also position flashcards as tools for retrieval practice, feedback, and responsive instruction rather than passive visual aids. This combination contributes a context-specific model for examining how low-cost media, reflective teaching, and individual assessment interact in foundational religious literacy within an Indonesian public primary school.

Several design boundaries limit the transfer of these findings beyond the participating classroom. Only one first-grade class of 20 students from a single public primary school participated in the study. Its classroom action design prioritized local instructional improvement and did not include a comparison group. The intervention ended after two cycles, preventing evaluation of whether students retained letter recognition over time. Assessment emphasized immediate cognitive scores, while classroom observations documented motivation, participation, and confidence without validated scales. Because the teacher implemented and evaluated the intervention, expectations may have influenced the qualitative records. Further studies should employ larger multisite samples, comparison groups, delayed post-tests, standardized engagement measures, and interviews to

examine retention, transfer, learner experience, and the conditions under which flashcard instruction remains effective.

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