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The Memorizing, Marking and Scanning (MMS) Method for Qur'an Memorization in An-Nur 2 Al-Murtadlo: A Grounded Theory Study

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ABSTRACT

This study was motivated by the rapid growth of Qur'an memorization (tahfidz) institutions in Indonesia, creating the need for structured cognitive strategies to overcome memory load and improve the retention of *mutashabihat* (similar) verses. The study explored the cognitive processes underlying the Memorizing, Marking, and Scanning (MMS) method developed at An-Nur 2 Islamic Boarding School, Bululawang. Using a qualitative approach with a Constructivist Grounded Theory design, data were collected through in-depth interviews, participant observation, and Focus Group Discussions involving seven participants, including the method's initiator, facilitators, and students. The findings indicate that MMS is more than a conventional memorization technique; it is a cognitive learning system integrating Information Processing Theory and Dual Coding Theory. The Memorizing stage strengthens verbal-auditory memory through repetition, Marking serves as a metacognitive monitoring process to identify and correct memory gaps, and Scanning reinforces retention through visual-spatial memory cues. The effectiveness of the method is supported by students' self-regulation in managing limited study time and facilitators' flexibility in accommodating different learning styles. In conclusion, MMS represents a holistic and adaptive cognitive intervention that enhances the long-term retention of Qur'an memorization. The findings provide a new theoretical framework for improving Qur'an memorization learning management in contemporary educational settings.

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Introduction

The growing public interest in Qur'an memorization (*tahfidz*) education has significantly transformed Indonesia's educational landscape (Sulaiman & Umi, 2023; Susanti & Sulaiman, 2020). Tahfidz programs have expanded beyond traditional Islamic boarding schools to formal primary and secondary schools, while universities increasingly offer special admission pathways and scholarships for Qur'an memorizers. This development has intensified the need for effective learning strategies capable of producing students with strong cognitive and spiritual competencies (Sulaiman & Umi, 2023).

Although Qur'an memorization is rooted in religious practice, it also represents a complex cognitive process involving working memory, neuroplasticity, and cognitive load management (Sulaiman, Syakarofath & Kusmana, 2024; Sulaiman, 2023). Previous studies have shown that sustained memorization activities improve executive functioning and long-term memory. However, many students struggle to retain large amounts of information, particularly *mutashabihat* (similar) verses, because the volume of memorized material exceeds the capacity of working memory. These challenges often reduce motivation and require structured cognitive interventions.

Existing studies have primarily examined traditional memorization methods, students' motivation, or repetitive learning strategies (Sulaiman & Azizah, 2020). More recent innovations, including intensive memorization programs, digital learning media, and mnemonic techniques, have improved learning efficiency but generally emphasize either auditory repetition or visual association without integrating both cognitive pathways. Furthermore, most approaches lack systematic metacognitive mechanisms that enable students to identify and correct their own memory weaknesses (Sulaiman, Rokhmah & Royhana, 2024).

To address these limitations, this study investigates the Memorizing, Marking, and Scanning (MMS) method, an indigenous cognitive innovation developed by Gus Fazlur Rahman Rahawarin at An-Nur 2 Islamic Boarding School, Bululawang. Unlike conventional memorization methods, MMS combines verbal-auditory repetition, metacognitive monitoring, and visual-spatial mapping into a unified learning system designed to strengthen long-term retention (Sulaiman, 2023). Within the Qur'an memorization process, the method functions primarily as a reinforcement strategy by integrating the stages of Memorizing, Marking, and Scanning, each targeting different cognitive mechanisms involved in encoding, monitoring, and retrieving memorized verses.

Given the absence of a comprehensive theoretical explanation of how this locally developed system operates, this study employs a Constructivist Grounded Theory approach to generate a substantive theoretical model of the MMS method. Through interviews, focus group discussions, and participant observation involving the method's initiator, facilitators, and students, the study seeks to explain how cognitive processes, instructional practices, and learning interactions collectively contribute to effective long-term Qur'an memorization.

Method

This study employed a qualitative approach using the Constructivist Grounded Theory method, which focuses on developing theory grounded in empirical data. This design was selected because the study aimed not merely to describe the phenomenon of Qur'an memorization (*tahfidz*), but specifically to construct a theoretical framework explaining the system, mechanisms, procedures, and cognitive processes underlying the Memorizing, Marking, and Scanning (MMS) method. Through the grounded theory approach, the researchers sought to

examine in detail how this memorization strategy was initiated, disseminated, monitored, and implemented systematically within the Islamic boarding school, ultimately generating a substantive theory that emerged directly from the social and cognitive interactions of the participants in the research setting.

Participant selection employed purposive sampling, followed by theoretical sampling to achieve data saturation and conceptual saturation. The study strategically involved seven key participants representing the entire MMS ecosystem at An-Nur 2 Islamic Boarding School, Bululawang. These participants included one *kyai*, Gus Fazlur Rahman Rahawarin, who served as the primary source of information regarding the philosophical foundation, historical development, and systemic design of the MMS method. In addition, two *ustadz* (teaching assistants) participated, as they were responsible for supervising students' memorization fluency and conducting the correction process during the Marking phase. The participant group was completed by four male students, purposively selected to represent different dormitories, in order to explore how they implemented auditory memorization and visual-spatial mapping (Scanning) while managing varying levels of cognitive load.

Data were collected comprehensively through three primary techniques: in-depth interviews, Focus Group Discussions (FGDs), and participant observation. Intensive interviews were conducted with Gus Fazlur to explore the conceptual framework and development of the MMS method, while interviews with the *ustadz* and students focused on their subjective experiences in managing time and cognitive capacity throughout the memorization program. FGDs were conducted with the teaching staff and student representatives to examine how shared discussions and collective understanding contributed to identifying and resolving difficulties associated with *mutashabihat* (similar) verses through the MMS process. In addition, participant observation was carried out directly in Qur'an memorization circles (*halaqah tahfidz*) and student dormitories to document daily learning routines, memorization submission procedures, and students' cognitive practices that were often not fully articulated during interviews.

All empirical data were analyzed using the constant comparative method, a core analytical procedure in grounded theory. The analysis began with open coding, in which interview transcripts, FGD recordings, and field observation notes were examined line by line to identify the smallest meaningful units related to the memorization process. The analysis then proceeded to axial coding, during which these initial codes were systematically connected to identify causal relationships, contextual factors, boarding school conditions, and instructional strategies employed by the *ustadz* in implementing the MMS method. Finally, selective coding was conducted to integrate all findings into a single core category, which provided a comprehensive explanation of the mechanisms, instructional system, and cognitive processes underlying successful Qur'an memorization through the MMS method, from its conceptual formulation by the *kyai* to its cognitive adaptation by the students.

Result and Discuss

To facilitate a comprehensive understanding of the MMS method, the researchers developed a summary outlining its stages, core activities, objectives, duration, and key considerations. Table 1 presents an overview of the MMS stages based on data obtained from in-depth interviews, Focus Group Discussions (FGDs), and participant observations.

Table 1. Summary of the MMS Method Stages

General Activities (Santri & Ustadz)	Objectives	Duration	Key Considerations
Memorizing Stage Students: Read and repeat each page at least 10 times, beginning with the first quarter of a *juz* (five pages) until it can be recited without errors. Once mastery is achieved, students continue to the next page, progressively repeating the material in a cumulative manner until the entire *juz* has been completed. Recitation is performed softly (audible only to oneself) using the hadr (rapid recitation) technique. When students experience difficulty connecting words or verses, they repeatedly practice the ending of one verse and the beginning of the next to strengthen continuity. Instructors: No specific instructional activities are assigned during this independent memorization stage.	To achieve complete fluency before progressing to the next stage. To develop automatic recitation without conscious effort. To establish a strong auditory-verbal foundation for memorization during the early stages of learning.	Approximately the first four days of the seven-day MMS cycle for each *juz*.	This stage must be carried out with full attention and concentration, as effective memorization cannot be achieved without focused engagement. Students should begin with a manageable target (one-quarter of a *juz*) ratherthan attempting to memorize an entire *juz* at once. They should not proceed to the next section until the current one can be recited accurately without errors. Intensive repetition (*murājaʿah*) constitutes the core component of this stage.
Marking Stage Students: Students do not memorize new material during this stage. Instead, they recite their memorization (*sima'an*) to the instructor. After the assessment, students review the instructor's correction marks, focus on correcting the identified errors, and repeatedly recite the assigned passages until all correction marks have been eliminated. Students also proactively perform Distinctive Marking by independently annotating similar (*mutashabihat*) verses using symbols, codes, or colored notes in the page margins. Instructors: While listening to students' recitation, instructors follow the students' copy of the Qur'an and use a pencil to circle every error, including incorrect	To refine and strengthen memorization by identifying and correcting minor weaknesses. To ensure that memorization is accurate, fluent, and free from errors. To enable students to recognize and distinguish similar (*mutashabihat*) verses, thereby preventing confusion or unintended transitions to different chapters or *juz*.	Approximately 2 days.	During this stage, students must devote their full attention to correcting existing memorization and must not memorize new material. Instructors should use a pencil so that correction marks can be erased once students have successfully corrected their mistakes. Correction marks should not be removed while students continue to hesitate or make errors. Annotating the Qur'an serves exclusively

pronunciation (*harakat*), incorrect words, omissions, and hesitation. The annotated copy is then returned to the student for revision.			educational and religious purposes and should not be regarded as defacement. The Asy-Syadzili Mushaf is recommended because it provides clear and reliable waqf and ibtidā' markings.
Scanning Stage Students: Students perform silent visual rehearsal without producing audible recitation, relying primarily on visual perception. The process begins by carefully observing a page of the Qur'an, closing their eyes, and mentally reconstructing the page layout, the arrangement of the verses, and the calligraphy (i.e., a mind palace). Students then reopen their eyes to compare the mental image with the actual page and repeat the process until the visual representation is firmly established in memory. Instructors: No specific instructional activities are assigned during this independent visualization stage.	To train students to create accurate visual representations of Qur'an pages in memory. To establish strong visual retrieval cues that enable students to recall the location of verses when verbal recall becomes uncertain, particularly when encountering *mutashabihat* (similar) verses.	The final day of the seven-day MMS cycle for each *juz*.	Minor subvocalization or slight lip movement is acceptable, provided that the sound remains inaudible to others and the primary focus remains on visual memory. The effectiveness of the scanning process is influenced by the number of verses on a page. Pages containing many short verses provide more visual landmarks or retrieval cues but may also increase the complexity of visual processing.

1. Integrated Mechanism of the Memorizing, Marking, and Scanning (MMS) Method

Field data indicate that the MMS method fundamentally functions as a cognitive reinforcement strategy that bridges the *ziyādah* (the addition of new memorization) and *murājaʿah* (the consolidation and maintenance of memorization) phases of Qur'an memorization. Historical accounts from the research site reveal that this innovation was originally conceived by Gus Fazlur Rahman Rahawarin through a process of deep reflection and extensive practical experience. Its implementation at An-Nur 2 Islamic Boarding School, Bululawang, has demonstrated a high level of effectiveness, with long-term memorization retention reportedly achieved by approximately 80%–100% of the students. Philosophically, the MMS method is designed not merely to enable accurate recitation but also to establish a durable and resilient memory foundation, allowing students to retain memorized verses over time while accurately identifying the precise location of each verse within the *muṣḥaf* (Qur'anic text).

2. Memorizing Stage: Activation of the Auditory Memory Pathway

The first stage, **Memorizing**, was identified as the most fundamental component of the MMS method, emphasizing intensive repetition as the foundation of the memorization process. This stage is designed to establish verbal fluency and activate the auditory memory pathway through continuous repetition, enabling students to achieve automatic recitation without conscious effort. Within the seven-day cycle allocated for completing one *juz*, the first four days

are devoted entirely to this auditory habituation process. Procedurally, students are instructed to focus on manageable learning targets by repeating each page at least ten times using a soft voice audible only to themselves. They are also required to practice the transition between the ending of one verse and the beginning of the next to minimize forgetting at verse boundaries. Only after successfully memorizing the first quarter of a *juz* (five pages) without errors are students permitted to proceed to the subsequent quarter. Observational and interview data further revealed the underlying pedagogical principle of this stage, reflected in the expression consistently emphasized by the instructors and embraced by the students: "Sregep Deres, Lancar Apalane," a Javanese proverb meaning, *"The more diligently one repeats the recitation, the more fluent the memorization becomes."*

3. Marking Stage: Cognitive Intervention and Metacognitive Error Correction

After four days of intensive verbal rehearsal, students transition to the Marking stage, which lasts for two consecutive days. The primary objective of this phase is to refine memorization by identifying and correcting minor errors. Consequently, students are strictly prohibited from memorizing new material during this stage. Observations of the *halaqah* sessions identified two complementary intervention techniques: Error Marking and Distinctive Marking. During Error Marking, students recite their memorization before an *ustadz*, who follows the student's copy of the *muṣḥaf* while using a pencil to circle every recitation error, including inaccuracies in pronunciation, wording, hesitation, or omissions. These pencil marks serve as visual indicators of weaknesses that require correction and may only be erased once the student demonstrates accurate recitation in a subsequent assessment. In contrast, Distinctive Marking is employed to differentiate *mutashabihat* (similar) verses. Students independently annotate their *muṣḥaf* using symbols, colored underlining, or brief marginal notes to distinguish verses that are potentially confusing. Regarding the ethics of annotating the *muṣḥaf*, Gus Fazlur emphasized during the in-depth interview.

4. Scanning Stage: Visual-Spatial Mapping of Qur'anic Verses

On the seventh day, the memorization process concludes with the Scanning stage, which is characterized by a distinctly different cognitive operation from the preceding stages. Whereas the Memorizing and Marking stages primarily rely on auditory processing and verbal recitation, the Scanning stage emphasizes silent visual imagery, requiring students to mentally capture and store the spatial layout of each *muṣḥaf* page. Using a technique comparable to the mind palace method, students carefully observe the arrangement of the verses, close their eyes to mentally reconstruct the page, including its calligraphy and the position of each verse, and then reopen their eyes to verify and refine the accuracy of the mental image. Observational findings indicate that this visualization process provides students with a powerful visual retrieval cue. When they hesitate while reciting *mutashabihat* (similar) verses, their mental imagery often guides retrieval, as reflected in the following description: *"Wait, the next verse is located in the lower-left corner of the page, not in the middle."* This finding is consistent with the well-known statement of Sheikh Ali Jaber, frequently quoted within the boarding school, that God has endowed human beings with eyes that function like an extraordinarily sophisticated scanning device for memorizing the Qur'an.

5. MMS Synthesis as an Integrated Cognitive Ecosystem

As an integrated pedagogical system, the MMS method combines the strengths of the auditory memory pathway developed during the *Memorizing* stage with the visual-spatial mapping process established during the *Scanning* stage, while the *Marking* stage serves as a metacognitive bridge that connects and reinforces both processes. The integration of these three stages is specifically designed to overcome the limitations of automatic verbal recall, which often leads students to confuse *mutashabihat* (similar) verses. Field findings indicate

that the successful implementation of this system requires a high level of cognitive endurance, as the cumulative repetition involved in a single memorization cycle is equivalent to reciting approximately twenty *juz* of the Qur'an. Consequently, boredom becomes one of the greatest challenges faced by students. To overcome cognitive fatigue and the time constraints of boarding school life, the *ustadz* consistently cultivate students' self-regulation through the following guidance: *"You must develop the mindset of 'stealing time.' Steal ten minutes before dawn, fifteen minutes after the Duha prayer, twenty minutes while waiting in line. Gather those stolen moments and dedicate them to the Qur'an."* Ultimately, the continuity of the MMS cognitive ecosystem is sustained beyond the formal memorization cycle through the habitual recitation of memorized verses during both obligatory and voluntary prayers, thereby reinforcing long-term retention through continuous retrieval practice.

6. Critical Analysis of the MMS Method from the Perspectives of Information Processing Theory and Dual Coding Theory

The effectiveness of the Memorizing, Marking, and Scanning (MMS) method as an integrated *tahfidz* system can be comprehensively explained through the lens of Information Processing Theory. According to this theoretical framework, human learning operates in a manner analogous to an information-processing system, involving three essential stages: sensory registration, working memory, and long-term memory (Gustami & Hardono, 2026). The Memorizing stage, which requires students to rehearse each page at least ten times, functions as the primary encoding mechanism within the memorization process. This intensive verbal rehearsal not only strengthens articulatory fluency but also reduces the risk of cognitive overload by preventing excessive demands on students' working memory. By applying the principle of chunking—that is, dividing complex information into manageable units, such as limiting new memorization to one-quarter of a *juz* before transferring it to long-term memory—the brain is provided with sufficient opportunity to organize and consolidate information systematically. Observational findings further revealed that the instructional principle consistently emphasized by the *kiyai*, *"Sregep Deres, Lancar Apalane"* ("The more diligently one repeats the recitation, the more fluent the memorization becomes"), provides empirical support for the central role of auditory rehearsal in establishing durable memory traces. This finding is consistent with the proposition of Roediger and Butler (2011), which has been further supported by contemporary research, that retrieval practice—the repeated act of actively recalling previously learned information—is one of the most effective strategies for promoting long-term memory retention.

Furthermore, the adaptive strength that makes the MMS method particularly robust becomes even more evident when examined through the lens of Dual Coding Theory, proposed by Allan Paivio. This theory posits that memory encoding is most effective when information is processed simultaneously through two distinct cognitive channels: the verbal and the visual systems. Within the MMS framework, the Memorizing stage is specifically designed to establish memory traces through the verbal-auditory channel by means of repeated recitation. In contrast, the Scanning stage functions as a cognitive strategy that exclusively strengthens memory traces within the non-verbal visual-spatial channel. When students close their eyes to mentally capture the location of verses, identify page positions, or visualize distinctive calligraphic patterns in the *muṣḥaf*, they are essentially constructing what can be described as visual retrieval cues. This dual-channel integration is consistent with the recent findings of Alhazmi (2024), who demonstrated that the combination of visual and auditory stimulation produces more durable long-term memory retention than single-channel encoding. Consequently, when students encounter retrieval difficulties due to the similarity of *mutashabihat* (similar) verses, the visual memory system automatically provides retrieval cues that guide them toward the correct sequence and precise location of the verses.

7. Self-Regulation and Metacognition in the Implementation of the MMS Method

Beyond the architecture of memory processing, the effectiveness of the Marking stage in the MMS method is closely associated with the development of students' metacognitive abilities. Conceptually, metacognition refers to an individual's awareness and understanding of their own thinking processes, including the ability to monitor and evaluate the blind spots in their understanding (Rochmat Thoriqul Izza, 2021). When an *ustadz* circles recitation errors through Error Marking, and students proactively underline, color-code, or annotate *mutashabihat* (similar) verses through Distinctive Marking, they are essentially engaging in metacognitive monitoring. Psychologically, this marking process prevents students from falling into the trap of blind repetition, which is both cognitively demanding and inefficient. Such metacognitive engagement, grounded in self-identification of learning difficulties, has been shown to facilitate deeper learning by transforming students from passive recipients of corrective feedback into active monitors of their own performance (Rosikhoh, Mardhiyatirrahmah, & Abdussakir, 2019). Consequently, their cognitive attentional resources can be allocated more effectively to specific areas requiring improvement.

Furthermore, the overall success of the MMS ecosystem ultimately depends on the foundation of Self-Regulated Learning (SRL). This is clearly reflected in the *kiyai*'s instruction that students must develop the mindset of "stealing time" amid the demanding routines of boarding school life. From the perspective of SRL theory, the practice of utilizing brief periods of available time—such as reviewing memorization while waiting in line for a shower, walking back to the dormitory, or during intervals between daily prayers—represents a sophisticated form of motivational regulation and behavioral self-management (Heli, 2024). Successful students are self-regulated learners who actively structure their learning environment to maintain continuous cognitive engagement with the Qur'an. Recent studies on academic stress in Islamic boarding schools (e.g., Akhtar & Mahmood, 2013; Bedewy & Gabriel, 2015) consistently suggest that, without strong self-regulation, even the most well-designed *tahfidz* system is unlikely to withstand the effects of mental fatigue. Consequently, the time-management strategies embedded within the MMS method transform the demands of Qur'anic memorization from a purely academic obligation into a sustained spiritual habit integrated into students' daily lives.

8. Adaptation to Students' Learning Styles within the MMS System

Although the MMS method is designed as a standardized Standard Operating Procedure (SOP), its implementation within the daily life of the Islamic boarding school provides students with sufficient flexibility to adapt the method to their dominant learning styles—Visual, Auditory, and Kinesthetic (VAK). By design, the Memorizing stage naturally accommodates auditory learners, who are particularly responsive to tone, rhythm, and vocal repetition. Likewise, the Scanning stage effectively supports visual learners by relying on the visual-spatial organization of the *muṣḥaf* as a memory aid. However, the most intriguing observational finding concerns how kinesthetic learners adapt the method through tactile and bodily engagement. Several students consistently preferred to memorize while gently swaying their bodies, pacing along the boarding school corridors, or synchronizing subtle finger movements with the rules of *tajwid*.

This phenomenon is not regarded by the facilitators as a deviation from the MMS methodology; rather, it is recognized as a natural adaptive strategy that enables students to channel cognitive stress through motor activity. Recent comparative studies on learning-style differentiation in *tahfidz* education, including the work of Cahya et al. (2023) on kinesthetic adaptations, have

demonstrated that memorization approaches incorporating rhythmic movement can enhance memory acquisition in a more inclusive manner. The flexibility of the MMS method in accommodating kinesthetic modifications ensures that students do not feel physically constrained while continuing to benefit from the auditory and visual components that constitute the core of the method. Therefore, the MMS method should not be viewed as a rigid instructional protocol but rather as a dynamic cognitive ecosystem. By integrating dual coding, metacognitive monitoring, sustained self-regulation, and flexibility in accommodating diverse learning styles, the MMS method emerges as a holistic, adaptive, and sustainable cognitive intervention for contemporary Qur'anic memorization education.

Although this study successfully developed a substantive theoretical framework explaining the cognitive mechanisms underlying the MMS method, several limitations should be acknowledged. The primary limitation concerns the demographic and ecological scope of the study, which was confined to male students at a single research site, namely An-Nur 2 Islamic Boarding School, Bululawang. Consequently, the grounded theory developed in this study may have limited transferability to female students or to non-residential *tahfidz* institutions with substantially different educational and cultural contexts. In addition, the exploration of cognitive processes relied primarily on participants' self-reported experiences obtained through in-depth interviews, complemented by behavioral observations conducted by the researcher. The study did not employ objective neuroscientific measures, such as electroencephalography (EEG) or eye-tracking technology, to examine cognitive processes during the **Scanning** stage. Therefore, future research is encouraged to evaluate the effectiveness of the MMS method through large-scale quantitative experimental designs and to integrate neurocognitive assessment techniques in order to provide biological evidence supporting its effects on long-term memory retention.

Conclusion

Based on the systematic analysis of the empirical data and the theory-building process, this study concludes that the Memorizing, Marking, and Scanning (MMS) method represents a comprehensive, adaptive, and robust cognitive system for enhancing the long-term retention of Qur'an memorization within the Islamic boarding school environment. Rather than relying solely on conventional repetition, the method integrates two complementary memory-processing pathways: strengthening verbal-auditory memory through the Memorizing stage and reinforcing visual-spatial memory through the Scanning stage, both of which are connected by the metacognitive monitoring process embedded in the Marking stage. The successful implementation of MMS among the students further demonstrates that effective Qur'an memorization depends not only on individuals' innate memory capacity but also on their self-regulation in managing the demands of boarding school life and on the method's flexibility in accommodating diverse learning preferences.

Theoretically, this study offers a substantive conceptual model that bridges the traditions of Islamic Qur'an memorization education with contemporary cognitive psychology. The findings demonstrate that indigenous educational practices developed within Islamic boarding schools can generate information-processing frameworks that are comparable to established theories of learning. Practically, the study provides an operational reference for *kyai*, Islamic boarding school leaders, Qur'an memorization instructors, and policymakers responsible for developing Islamic education curricula. The MMS framework may be adopted and adapted by Qur'an memorization institutions as a systematic instructional model for developing memorizers who are not only fluent in recitation but also cognitively resilient, mentally disciplined, and capable of maintaining accurate long-term memorization.

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