

Neuro-Qur'anic Learning for Resilient Memorisation Through Brain Rhythm Method

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ABSTRACT: *Qur'anic memorisation quality depends not only on the amount of text retained but also on durable recall, tajwid accuracy, meaning-supported retrieval, focused learning, and resilient murāja'ah. This model-development article formulates Neuro-Qur'anic Learning based on the Brain Rhythm Method (NQL-MRO) as a testable pedagogical framework for adolescent ḥuffāẓ. Using a design-and-development logic, the manuscript synthesises practice-based accounts of MRO, tahfiz pedagogy, and memory-sensitive learning literature, along with reviewer-directed refinement, into a model that specifies learning components, classroom syntax, assessment indicators, and a validation pathway. NQL-MRO organises memorisation through intention and attention readiness, structural and semantic mapping, selective visual-tajwid coding, rhythmic auditory recitation, kinesthetic writing, bil-ghaib recitation with diagnostic feedback, and delayed murāja'ah. The model's central contribution is the construct of memorisation resilience: the capacity to detect weakening, recover forgotten passages, and maintain prior memorisation while adding new material. The article contributes a concise theory of action, implementation tables, an operational scoring rubric, and high-resolution conceptual figures for future expert validation and empirical testing.*

Mutu hafalan Al-Qur'an tidak hanya ditentukan oleh jumlah teks yang dihafal, tetapi juga oleh ketahanan ingatan, ketepatan tajwid, pemanggilan kembali yang didukung pemahaman makna, fokus belajar, serta *murāja'ah* yang resilien. Artikel pengembangan model ini merumuskan Neuro-Qur'anic Learning berbasis Metode Ritme Otak (NQL-MRO) sebagai kerangka pedagogis yang dapat diuji pada remaja ḥuffāẓ. Dengan logika design-and-development, naskah ini mensintesis praktik MRO, pedagogi tahfiz, literatur pembelajaran berbasis memori, dan masukan peninjau menjadi model yang memuat komponen, sintaks pembelajaran, indikator asesmen, serta jalur validasi. NQL-MRO mengorganisasi hafalan melalui kesiapan niat dan perhatian, pemetaan struktur dan makna ayat, pengodean visual-tajwid secara selektif, pelafalan ritmis, penulisan kinestetik, setoran bil-ghaib dengan umpan balik diagnostik, dan

murāja'ah tunda. Kontribusi utamanya adalah konsep resiliensi hafalan, yaitu kemampuan untuk mendeteksi pelemahan, memulihkan bagian yang terlupa, dan menjaga hafalan lama saat hafalan baru ditambahkan. Artikel ini menyediakan teori tindakan, tabel implementasi, rubrik skor, dan gambar konseptual untuk validasi ahli serta pengujian empiris.

Keywords: *Neuro-Qur'anic Learning; Brain Rhythm Method; Qur'anic Memorisation; Tajwid Accuracy; Memorisation Resilience.*

I. INTRODUCTION

Qur'anic memorisation is a devotional, linguistic, moral, and cognitive practice in which learners are expected to preserve sacred text with accuracy, adab, continuity, and reverence. In tahfiz education, a memorised passage must be recalled in sequence, pronounced with tajwid, reviewed over time, and integrated into the learner's spiritual life. Classical tahfiz manuals and contemporary empirical studies consistently emphasize that memorization is shaped by repetition, teacher correction, *murāja'ah*, method selection, institutional culture, learner strategy, and disciplined practice rather than by memory talent alone (Al Hafidz & Al Hafidz, 1994; Ariffin et al., 2013; Fakhruddin et al., 2020; Halim et al., 2025; Hashim, 2015; Sadulloh, 2008; Wahid, 2014).

This article addresses the persistent gap between memorisation quantity and quality. Many programs can help students add pages, surahs, or juz. However, older memorisation may weaken when new material is introduced, and immediate fluency may conceal errors in mad, ghunnah, qalqalah, makharij, or waqf and ibtida'. This problem is not only individual but also curricular and institutional because tahfiz systems need clearer sequencing, more explicit assessment, and stronger links between learning activities and long-term outcomes (Abd Ghani et al., 2026; Awang et al., 2025; Inayatul Mahfudloh et al., 2026; Nordin et al., 2023; Taat et al., 2021). The field is also moving towards more explicit models of Qur'anic memorisation and cognitive learning rather than relying only on descriptive accounts (Daud et al., 2024).

The Brain Rhythm Method, or Metode Ritme Otak (MRO), provides a relevant practice-based starting point. MRO is commonly described as combining rhythm, repetition, tajwid coding, writing, oral recitation, listening, bodily involvement, and basic meaning-making. Existing Indonesian studies suggest that MRO can support motivation and the maintenance of memorisation, but the literature remains closer to practical description than to formal pedagogical modelling (Jannah, 2026; Nurgaha, 2019). The gap is therefore precise: MRO has instructional promise, yet it has not been sufficiently translated into an evaluable model with defined components, syntax, mechanisms, indicators, rubrics, and validation procedures.

This article addresses that gap by developing Neuro-Qur'anic Learning based on the Brain Rhythm Method (NQL-MRO). The term "neuro" is used pedagogically and cautiously. It does not claim that the model measures brain activity or establishes neurological causality.

Evidence on Qur'anic memorisation and memory cautions against inflated claims that memorisation automatically generalises to broader memory capacity (Black et al., 2020). Here, "neuro" signals attention to instructionally relevant processes: attention, cue construction, rhythm, multisensory association, sequence retrieval, feedback, delayed review, and recovery after forgetting.

This article contributes in three ways. First, it conceptualises MRO as an instructional model rather than a loose collection of practices. Second, it operationalises memorisation quality through retention, tajwid accuracy, comprehension of meaning, focus, and memorisation resilience. Third, it proposes a validation pathway that can guide expert review, pilot testing, fidelity monitoring, inter-rater tajwid assessment, and classroom trials. The central theoretical contribution is memorisation resilience: the learner's capacity to detect weakening, recover forgotten passages, and maintain prior memorisation while new material is added. The article therefore argues that NQL-MRO is best understood not merely as a multisensory model, but as a model for resilient Qur'anic memorisation.

II. METHOD

This study uses a design-and-development orientation. The object of development is an instructional model, not an intervention-effectiveness claim. In this orientation, researchers specify an educational product in terms of objectives, assumptions, components, procedures, teacher roles, learner actions, indicators, and validation plans before empirical testing (Sugiyono, 2019). The source materials for model construction included practice-based MRO descriptions, classical and contemporary tahfiz literature, studies on the assessment and technology of Qur'anic memorisation, and memory-sensitive educational literature. This manuscript has not yet included expert validation, pilot classroom implementation, or a comparative trial; those steps are proposed as the next stage of validation.

The development procedure followed six steps. First, we defined the recurrent problems: unstable delayed retention, inconsistent tajwid, confusion among similar verses, fragmented attention, and unsystematic *murāja'ah*. Second, MRO practices were extracted as observable activities: intention orientation, ayah mapping, selective tajwid coding, rhythmic recitation, code writing, bil-ghaib recitation, diagnostic feedback, and delayed review. Third, these activities were converted into components only when they satisfied three criteria: they addressed a defined memorisation problem, produced observable learner or teacher action, and could be linked to a measurable outcome. Fourth, the components were organised into an implementation syntax. Fifth, the assessment domains were operationalised into rubrics. Sixth, the author specified a future validation pathway through expert judgment, feasibility testing, fidelity logs, inter-rater tajwid reliability, delayed-recall testing, and mixed-method explanation.

The literature was not used as a mini-review but to support the model's mechanisms theoretically. Tahfiz studies informed the learning ecology and teacher-guided practices; tajwid verification and assessment studies informed error categorization; cognitive and memory studies informed delayed retrieval, rhythm, working memory, and cue construction; and technology studies were positioned as supporting context rather than as core pillars because NQL-MRO is not a digital intervention (Ab Alim et al., 2025; Abdullah et al., 2019; Aditia et al., 2024; Ahmad et al., 2022; Aldaghaishi et al., 2025; Almosallam et al., 2015; Al-Mosallam, 2013; Aziz et al., 2019; bin Musa, 2025; Hassan, 2023; Mustafa et al., 2021; Purbohadi et al., 2019).

Validity and reliability are treated as planned requirements rather than completed results. Content validity should involve tajwid specialists, tahfiz practitioners, Islamic education scholars, and educational methodologists. Assess feasibility using teacher logs, session durations, learner artifacts, and completion rates. Tajwid accuracy should be scored by at least two trained assessors using error categories such as mad, ghunnah, qalqalah, makharij, and waqf-ibtida'. Empirical testing should use pre-test, post-test, and delayed-test designs, accompanied by interviews or observations to explain how coding, rhythm, meaning, and *murāja'ah* shape learner experience.

III. RESULT AND DISCUSSION

This model-development article presents the NQL-MRO framework. Figure 1 shows its theory of action. The model begins from three inputs: learner readiness, Qur'anic input, and the learning ecology. It then organises five instructional cue systems—visual-tajwid coding, rhythmic recitation, kinesthetic writing, meaning-making, and resilient *murāja'ah*—into two mechanisms: multichannel encoding and retrieval regulation. Expected outcomes include long-term retention, tajwid accuracy, and memorization resilience. The arrows should not be read as proof of causal superiority; they specify testable relations for future validation.

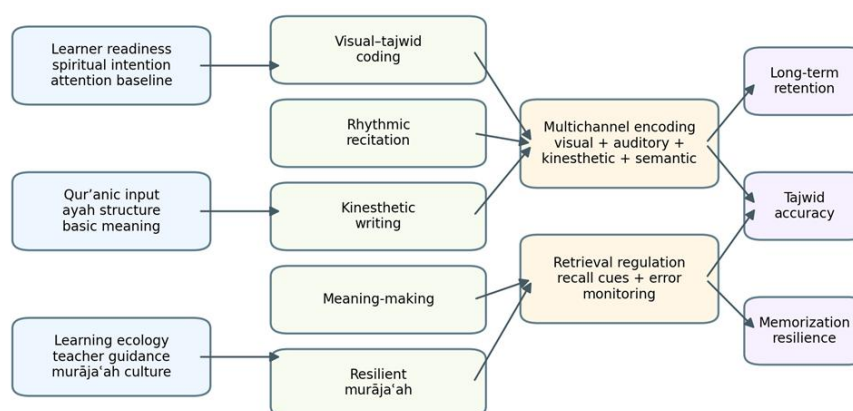


Figure 1. *Conceptual architecture of NQL-MRO. The figure clarifies how readiness, Qur'anic input, and the teacher-guided learning ecology translate into coordinated cues that support durable and recoverable bil-ghaib retrieval.*

The first conceptual refinement reduces theoretical overextension. Earlier versions of the manuscript gave substantial space to technology, AI, and gamification. In the model, these studies are treated as pedagogical affordances rather than theoretical pillars. The decisive pillars are encoded repetition, multisensory cueing, temporal or rhythmic scaffolding, tajwid externalisation, semantic anchoring, and resilient retrieval. This positioning is consistent with memory literature showing the importance of retrieval opportunities, spacing, sequence maintenance, and learning design, while avoiding simplistic claims that rhythm or multisensory exposure automatically improves learning (Borderie et al., 2024; De Winne et al., 2022; Howard et al., 2022; Ji & Han, 2026; Kelley & Whatson, 2013; Narkhede et al., 2024; Paraskevopoulos et al., 2024; Rao, 2018; Weng et al., 2026).

The second refinement is to explain MRO more concretely for international readers. In classroom terms, the teacher first clarifies the target passage and reminds learners of adab. Learners then map the ayah boundary, repeated phrase, and basic meaning. Selected tajwid features are marked using simple teacher-approved signs, for example, numeric duration cues for mad or symbolic marks for recurring articulation issues. Learners recite the passage with stable rhythm under tajwid control, write or review codes for difficult points, recite bil-ghaib, receive diagnostic correction, and return to the passage after delay. The codes are not meant to replace the mushaf, talaqqi, or teacher correction; they are temporary external cues that should be gradually withdrawn.

Table 1 revises the earlier component table to give each component a clearer analytical function. Rather than repeating teacher and learner actions, it links each component to its mechanism, expected outcome, and theoretical support. This distinction directly addresses the need for clearer table differentiation and gives future researchers a way to test whether specific components contribute to specific outcomes.

Table 1. Theoretical architecture of NQL-MRO.

Component		Mechanism	Expected outcome	Theoretical support
Intention and attention readiness	and	Reduces distraction and prepares learners for purposeful encoding	Focus and task completion	School climate, learner discipline, and teacher support literature
Structural semantic mapping	and	Creates meaning-based anchors and a sequence map	Meaning-supported recall	Meaning, schemata, Arabic and

			topical visualisation studies
Visual-tajwid coding	Externalises error-prone recitation rules before oral recall	Fewer targeted tajwid errors	Tajwid checking and recitation verification studies
Rhythmic recitation	Provides temporal scaffolding for ordered retrieval	Improved flow and reduced hesitation	Rhythm and auditory sequence literature
Kinesthetic writing	Slows attention and creates a visible learning artefact	Reduced repeated errors	Tahfiz processes and cognitive-load management
Resilient <i>murāja'ah</i>	Uses delayed recall and old-new interleaving to detect weakening	Memorization resilience	<i>Murāja'ah</i> , adaptive learning, and delayed-recall studies

Meaning-making is retained as a modest but important support. Some studies caution that verbatim Qur'anic memorisation can occur without full Arabic comprehension, but others show that understanding phrase meaning, Arabic schemata, topical flow, and verse relations can support memorisation performance (Baharudin & Sahad, 2020; Black et al., 2020; Hussin et al., 2021; Parveen, 2021; Rijan et al., 2025; Salehuddin, 2018; Suryana et al., 2024). NQL-MRO resolves this tension by distinguishing necessity from usefulness: it does not treat semantic understanding as a prerequisite for every act of recall, but as a cue that can support recovery, moral engagement, and delayed continuity.

Tajwid accuracy is also reframed as an assessable domain rather than a general impression of correctness. Automated tajwid checking, mad-rule classification, and recitation verification show that recitation features can be categorised and evaluated with specificity (Anggraini et al., 2026; Jamaliah Ibrahim et al., 2013; Rajagede & Hastuti, 2021). NQL-MRO translates that logic into teacher-guided pedagogy. The model does not replace human correction; it helps teachers and learners anticipate and record error-prone points before bil-ghaib performance.

Development and Validation Pipeline

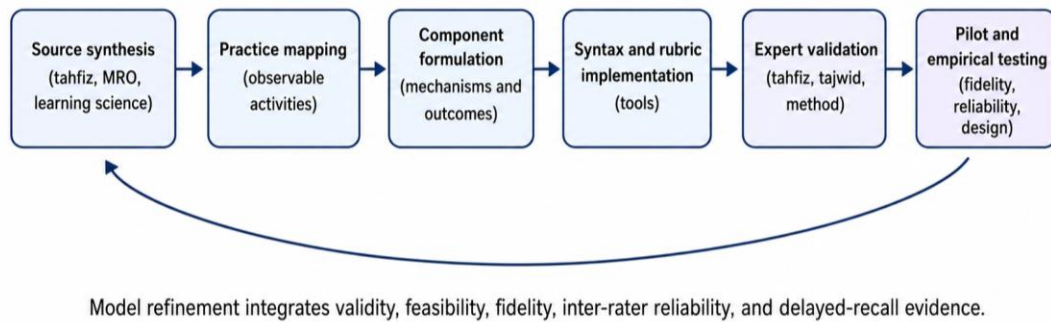


Figure 2. *Development and validation pipeline. The model moves from source synthesis and practice mapping to expert validation, feasibility testing, reliability assessment, and empirical trials, making clear that this article proposes a testable model rather than proven effectiveness.*

Table 2. Classroom implementation syntax for NQL-MRO.

Phase	Teacher action	Learner action	Evidence of completion
1. Orient	Clarifies target, adab, and focus	Prepares material and removes distractions	Target stated; learner begins on task
2. Map	Explains ayah boundary, theme, and key words	Marks structure and similar phrases	Short oral explanation of passage flow
3. Code	Demonstrates approved tajwid signs	Adds selective visual-tajwid cues	Coding checked by teacher
4. Recite	Models rhythm within tajwid rules	Repeats with controlled pace	Reduced hesitation and stable flow
5. Write	Assigns written coding for difficult points	Writes or reviews selected cues	Completed coding record
6. Setoran	Records errors and gives diagnostic feedback	Recites bil-ghaib	Setoran score and error notes
7. Review	Schedules delayed and interleaved <i>murāja'ah</i>	Retrieves old and new passages	Delayed recall record
8. Reflect	Identifies weakness and corrective route	Plans next review action	<i>murāja'ah</i> plan

Fig. 3 presents NQL-MRO as a cycle rather than a linear sequence. This matters because tahfiz learning often requires return loops. A tajwid error returns the learner to visual coding; sequence confusion returns the learner to structural mapping and rhythm; weak delayed recall returns the learner to *murāja'ah* planning. The teacher's role is therefore

expanded from listener and evaluator to cue designer, error diagnostician, and manager of delayed review.



Figure 3. *NQL-MRO learning cycle. The cycle shows how intention, mapping, coding, rhythm, writing, feedback, delayed review, and reflection operate as a repeatable syntax for resilient Qur'anic memorisation.*

Table 3. Operational scoring rubric for Qur'anic memorisation quality.

Indicator	4	3	2	1
Retention	Accurate sequence; no or minimal prompts; continues from varied points	Mostly accurate; few prompts or hesitations	Frequent prompts; unstable continuation	Breaks sequence and cannot resume
Tajwid accuracy	Few/no errors in target categories	Minor errors corrected after feedback	Repeated errors in several categories	Frequent errors in disrupt recitation
Meaning comprehension	Explains key words, theme, and adjacent relations	Understands theme with minor gaps	Recognises only isolated meanings	Shows little link between lafaz and meaning

Focus	Sustained attention and task completion	Occasional distraction; returns with cue	Frequent redirection needed	Unable to complete learning activity
Memorisation resilience	Maintains old passage after delay and recovers using cues	Weakening appears but is repaired through review	Old material unstable after new learning	Old memorisation collapses after delay

The scoring rubric makes the construct of memorisation resilience measurable. Resilience does not mean that the learner never forgets. It means that weakening is detected, error patterns are visible, and recovery can occur through cues, feedback, and scheduled review. This construct links the practical tahfiz concern for mutqin performance to measurable indicators such as delayed recall, old-new interleaving, repeated-error recurrence, prompting, and cue-based recovery. It also prevents overreliance on immediate setoran, which may overestimate memorisation durability.

Table 4 positions NQL-MRO in relation to other approaches. The model does not claim to replace Sabak, Sabki, Manzil, tasmik, *murāja'ah* routines, mind mapping, mobile tools, or gamified systems. Its contribution is integrative: it sequences teacher-guided recitation, temporary visual coding, rhythm, writing, meaning, and delayed review into an evaluable pedagogy. This comparison also clarifies why technological tools remain secondary. Apps, AI feedback, and adaptive scheduling can support practice, motivation, accessibility, or recitation verification, but they require a pedagogical architecture to define what should be supported and how (Ab Alim et al., 2025; Abdullah et al., 2019; Aditia et al., 2024; Adiwisastro et al., 2025; Ahmad et al., 2022; Aldaghaishi et al., 2025; Almosallam et al., 2015; Al-Mosallam, 2013; Aziz et al., 2019; bin (Musa, 2025; Hassan, 2023; Hassan et al., 2026; Ismail et al., 2024; Mustafa et al., 2021; Purbohadi et al., 2019).

Table 4. Comparative contribution of NQL-MRO.

Approach	Main emphasis	Limitation addressed by NQL-MRO	Added value of NQL-MRO
Classical setoran/tasmik	Teacher listening, correction, and acceptance of recitation	May emphasise immediate performance	Adds delayed recall, cue diagnosis, and resilience scoring
Sabak/Sabki/Manzil routines	Daily new lesson, recent review, and old review	Often lacks explicit cognitive cue design	Connects review to visual, auditory,

			semantic, and kinesthetic cues
Mind mapping/topical visualization	Spatial organisation of Qur'anic content	May not directly target tajwid and bil-ghaib errors	Integrates meaning maps with tajwid coding and recitation feedback
Mobile/AI/gamified systems	Access, motivation, feedback, scheduling, or verification	Tool features may define pedagogy	Provides teacher-guided instructional architecture for tool use
NQL-MRO	Coordinated coding, rhythm, writing, meaning, feedback, and delayed review	Requires validation and teacher training	Offers a testable model of resilient Qur'anic memorisation

The model has practical implications for institutions. In intensive pesantren settings, the full cycle can be used daily. In regular tahfiz houses, mapping and coding may be used for new passages while delayed *murāja'ah* is scheduled weekly. In home-assisted settings, teachers can provide coding conventions and a review schedule, while families support repetition. These scenarios are consistent with studies showing that the quality of memorisation depends on institutional climate, curriculum design, teacher support, learner routine, and method choice (Awang et al., 2025; Dzulkifli et al., 2014; Fakhruddin et al., 2020; Kurniailah & Bakar, 2023; Taat et al., 2021).

The model also has risks. Coding can overload working memory if every feature is marked; therefore, NQL-MRO requires selective teacher-approved coding and gradual withdrawal of external cues. Rhythm can be misused if treated as ornamentation; therefore, it must remain subordinate to tajwid. Writing can consume time; therefore, kinesthetic coding should be reserved for difficult passages, repeated errors, or similar verses. The term “neuro” can invite overclaiming; therefore, describe the model as memory-sensitive pedagogy rather than brain measurement. These cautions align with cognitive-load and memorisation studies that warn against excessive instructional burden and unsupported generalisation (Black et al., 2020; Dimyathi et al., 2025; Parveen, 2025).

The limitations are clear. This article presents a literature-derived, practice-informed prototype; it is not yet expert-validated or empirically proven. The model should next undergo content validity review, feasibility testing, fidelity analysis, inter-rater tajwid reliability assessment, and mixed-method classroom trials. A robust empirical study should compare NQL-MRO with usual tahfiz routines using baseline equivalence, pre-test, post-test,

delayed-test, and qualitative explanation. Module-development studies in related Islamic education contexts show that expert review, usability testing, and iterative refinement are essential before broad implementation (Ishak et al., 2022). The most defensible claim, therefore, is not that NQL-MRO is superior, but that it is now sufficiently specified to test.

IV. CONCLUSION

This article developed a model of Neuro-Qur'anic Learning based on the Brain Rhythm Method for resilient Qur'anic memorisation. The model addresses a core challenge in tahfiz education: memorisation quality must include durable recall, tajwid accuracy, meaning-supported retrieval, focused learning, and the ability to recover weakened passages after a delay. NQL-MRO organises these aims through intention and attention readiness, structural and semantic mapping, selective visual-tajwid coding, rhythmic recitation, kinesthetic writing, bil-ghaib recitation with diagnostic feedback, and resilient *murāja'ah*.

The main contribution is a testable theory of action. NQL-MRO converts a local practice into an evaluable instructional model with defined mechanisms, implementation syntax, scoring rubrics, comparative positioning, and a validation pathway. It preserves teacher-guided recitation and spiritual adab while making pedagogical mechanisms explicit. The model should now undergo expert validation, feasibility trials, fidelity monitoring, inter-rater tajwid assessment, delayed-recall testing, and mixed-method classroom research. Its immediate contribution is therefore not proven effectiveness but a coherent, researchable framework for studying and strengthening resilient Qur'anic memorisation.

V. ACKNOWLEDGEMENTS

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