

**Cognitive Learning-Based Evaluation of Tahfiz Al-Qur'an Programs: Evidence from Spaced and Massed Learning****Gozali, Uus Ruswandi, Ajid Thohir, Qiqi Yuliati Zaqiah****Email author: [1gozali@stiq.assyifa.ac.id](mailto:gozali@stiq.assyifa.ac.id) [2uusruswandi@uinsgd.ac.id](mailto:uusruswandi@uinsgd.ac.id)****[3ajid.thohir@uinsgd.ac.id](mailto:ajid.thohir@uinsgd.ac.id) [4qiqiyuliatizaqiah@uinsgd.ac.id](mailto:qiqiyuliatizaqiah@uinsgd.ac.id)****Universitas Islam Negeri Sunan Gunung Djati Bandung, Indonesia****Abstract**

The Tahfiz Al-Qur'an program in Islamic schools requires an evaluation system that maintains a balance between the quantity and quality of students' memorization. However, the implementation of the evaluation of the Tahfiz Al-Qur'an program is often unstructured and has not fully integrated learning theory. This study aims to analyze the evaluation of Spaced and Massed Learning in Tahfiz Al-Qur'an programs to strengthen the quality of student memorization. This study uses a qualitative case study approach at the Integrated Islamic Senior High School in Indonesia. Data were collected through in-depth interviews with school leaders, program managers, Qur'anic tahfiz teachers, and students; observation of the implementation of memorization evaluations; and documentation of quality standards and reports on Qur'an memorization achievements. Data analysis was carried out using Creswell's model, including thematic coding and the triangulation of sources and techniques. The findings show that the quality of Qur'an memorization is strengthened through a structured evaluation cycle that combines intensive repetition with distributed reinforcement, reflecting the complementary role of centralized and distanced learning mechanisms. These results suggest that memorization effectiveness is influenced not only by teaching practices but also by the dynamics of cognitive memory consolidation. This research provides a theoretical contribution to the development of Islamic education evaluation and a practical reference for the management of the tahfiz Al-Qur'an program, oriented towards the quality of sustainable memorization based on learning theory.

**Keywords:** *Tahfiz Al-Qur'an; Program Evaluation; Al-Qur'an Memorization Quality; Spaced Learning; Massed Learning*

**Introduction**

The Tahfiz Al-Qur'an program is one of the strategic programs in Islamic education that aims to form a generation of Qur'an memorizers with accurate, stable, and sustainable memorization. In recent decades, many modern Islamic educational institutions have integrated Qur'anic tahfiz programs as part of the formal curriculum to strengthen the formation of religious character as well as students' academic achievement (Che Wan Mohd Rozali et al., 2022; M. K. H. Othman et al., 2024; Umar et al., 2023). The process of memorizing the Qur'an is not only a spiritual practice but also a cognitive activity closely related to the mechanisms of memory, retention, and reinforcement of learning (Davies & Mansour, 2022; Mc Veigh et al., 2022). Research in learning psychology shows that memory stability is strongly influenced by the regulation of exercise patterns and repetition intervals during the learning process (Caffrey & Commins, 2023; Wimmer & Poldrack, 2022). In this context, the concepts of spaced learning and massed learning are often used in the educational literature to explain how practice settings affect memory retention and learning sustainability (Kukushkin et al., 2024; X. Yan et al., 2024). Apart from being a religious practice, the tahfiz of the Qur'an also involves complex learning dimensions, ranging from cognitive and affective aspects to continuous practice disciplines. Memorizing the Qur'an is carried out through the process of reading, listening, repeating, and systematically depositing memorized material with the Qur'an tahfiz teacher, thus forming a repetitive, structured learning cycle. This process shows that tahfiz does not depend solely on individual students' abilities but is also influenced by the learning design, the intensity of training, and the mentoring system implemented by educational institutions. In the context of formal education, good management of the Qur'an tahfiz program is an important factor in maintaining the sustainability of the memorization process and ensuring that students are not only able to achieve memorization targets, but also maintain the quality of memorization in the long term (Che Wan Mohd Rozali et al., 2022; Ishak et al., 2022). Along with the growing number of Qur'anic tahfiz educational institutions in various Muslim countries, attention to the quality of the management and evaluation systems for the Qur'an tahfiz program is also increasing. Various studies show that strengthening the quality of the Qur'an tahfiz program requires a comprehensive approach, not only in learning methods but also in measuring program performance, monitoring students' memorization development, and supporting a conducive learning environment. This approach is important to ensure that the Qur'an tahfiz learning process produces strong, stable, and sustainable memorization, while providing a comprehensive picture of the institution's performance in organizing Qur'anic tahfiz education (A. Othman et al., 2024; M. K. H. Othman et al., 2024).

Although Qur'anic tahfiz programs are growing rapidly in various Islamic educational institutions, the evaluation practices applied often still focus on achieving memorization quantity as a key indicator of success. This approach has not fully described memorization quality in terms of memory durability, memorization stability, and the consistency of students' murāja'ah (Singki et al., 2026). As a result, it is not uncommon to find the phenomenon of memorization that is quickly achieved but easily weakened in the long term. Several studies on tahfiz Al-Qur'an have mostly discussed learning methods, memorization strategies, and the development of student coaching modules (Che Hassan et al., 2022; Taat et al., 2021), while studies on the evaluation design of the Qur'an tahfiz program remain relatively limited. This condition causes the evaluation of the Qur'an tahfiz program to often only function as a tool to measure memorization achievement, not as an analytical mechanism to understand the quality of memorization retention and the effectiveness of the learning program as a whole (Alnajashi et al., 2025; Holcomb et al., 2022; Tarmuji et al., 2022).

Spaced learning has an important role in strengthening long-term memory retention through repetition spread over a specific time interval (Ishak et al., 2022; Maulidia et al., 2021). In contrast, massed learning tends to result in rapid but less stable mastery in the long term because memory reinforcement is not optimal (Yang et al., 2025; Zulhannan & Musyarrofah, 2024). Neurocognitive research has even shown that spaced learning can improve the stability of memory representations by re-encoding prior experiences in the brain's memory system (Zou et al., 2025). The findings show that exercise patterns and repetition intervals are important factors in maintaining memory stability in various learning contexts (Kukushkin et al., 2024; Wimmer & Poldrack, 2022). However, in the context of Qur'an tahfiz education, the two concepts are generally still understood as learning strategies rather than as an evaluative framework for assessing the effectiveness of the Qur'an tahfiz program as a whole.

Based on these conditions, there is a gap in the literature on how the principles of spaced and massed learning can serve as a basis for analysis in evaluating the Tahfiz Al-Qur'an program. In fact, integrating the two concepts has the potential to provide a more comprehensive evaluative framework for assessing the quality of student memorization, especially in the areas of hifz, taḥḥīṭ, and the consistency of murāja'ah. Therefore, this study aims to evaluate the Tahfiz Al-Qur'an program using the frameworks of spaced and massed learning as an integrative evaluation approach to assess its effectiveness in strengthening the quality of student memorization.

This research has both academic and practical significance. Academically, this research contributes to the development of Tahfiz education evaluation studies by integrating perspectives from cognitive science and modern learning theories into the analysis of the Tahfiz Al-Qur'an program. In practice, the results of this study are expected to provide recommendations for Islamic educational institutions on designing an evaluation system for tahfiz programs that assesses not only the quantity of memorization but also its quality, including stability, reading accuracy, and consistency in students' murāja'ah.

This research evaluates the Tahfiz Al-Qur'an program in the context of Islamic secondary education, focusing on how the application of spaced and massed learning patterns affects the quality of student memorization. This study is limited to evaluating program effectiveness and the quality of student memorization and does not specifically discuss individual psychological factors or detailed technical methods for teaching Qur'an memorization.

**LITERATURE REVIEW**

The tradition of hifz Al-Qur'an (memorizing the Qur'an) has been an important part of the Islamic education system since the early days of the development of Islamic civilization. In the classical literature of ulūm Al-Qur'an, scholars affirm that the preservation of the Qur'an is carried out through two main mechanisms, namely written transmission and oral transmission through memorization. This memorization process not only serves as a means of spiritual learning but also as an authentication system for the text of the Qur'an, ensuring the accuracy of the reading and the continuity of the transmission of revelation from generation to generation (Al-Qathan, 2006, p. 24). In practice, memorization is always accompanied by murāja'ah (repetition of recitations and review of memorized material), which helps maintain memorization stability and minimize reading errors.

In contemporary Islamic education, this tradition is realized through the development of Tahfiz education programs across various Islamic educational institutions. The tahfiz program aims to produce a generation of Qur'an memorizers who are not only able to memorize verses quantitatively but also possess strong, sustainable memorization skills. Therefore, the success of the tahfiz program is not only measured by the number of juz memorized, but also by the accuracy of the reading, the stability of memorization in long-term memory, and the consistency of students in performing murāja'ah. Thus, the management of tahfiz programs requires a

systematic evaluation system to ensure the quality of students' memorization is maintained throughout the learning process (Ishak et al., 2022). Therefore, the management of the Qur'an tahfiz program requires a structured system that includes planning, implementation, and evaluation to ensure the quality of students' memorization (Alnajashi et al., 2025).

Several studies show that the development of tahfiz institutions in various Muslim countries has increased significantly in the last two decades. This growth is driven by increasing public interest in Qur'an-based education and government policies that support the development of tahfiz institutions. However, various studies also show that many tahfiz institutions still face challenges in developing learning and evaluation systems that can optimally improve the quality of student memorization (A. Othman et al., 2024). This shows that strengthening the evaluation system of the Qur'an tahfiz program is an important aspect in improving the overall quality of Qur'an tahfiz education (Nasrulloh et al., 2022).

In the Qur'anic tahfiz program, evaluation is carried out through various forms of assessment such as memorization deposits, tasmi', one juz exams, and murāja'ah evaluations. This evaluation system aims to ensure the accuracy of reading, the fluency of memorization, and the stability of students' memorization. Thus, evaluation in the Tahfiz Al-Qur'an program not only serves as a tool to measure memorization achievement but also as a mechanism to strengthen memorization quality continuously.

The quality of Qur'an memorization is measured by three main indicators: ḥifẓ, taṭbīt, and murāja'ah. The concept of ḥifẓ refers to students' ability to memorize the Qur'an with accurate readings, in accordance with the rules of tajweed and the makhārij al-ḥurūf. The accuracy of the reading is a fundamental aspect of memorizing the Qur'an, because errors in the pronunciation of letters or the brevity of the reading can change the meaning of the verses. Therefore, in the process of learning tahfiz Al-Qur'an, teachers usually directly supervise students' recitations through tasmi' activities to ensure the accuracy of memorization (Badran, 2018, pp. 52–59; Hamzah et al., 2024). In addition to the accuracy of the reading, the quality of memorization is also determined by taṭbīt, which is the stability of memorization in long-term memory. Taṭbīt demonstrates students' ability to retain memorized material without a significant decrease in quality or forgetfulness. In learning tahfiz Al-Qur'an, memorization stability is very important because memorization of the Qur'an is not only intended for the short term but must be maintained throughout life. Therefore, various Qur'an tahfiz institutions implement periodic evaluation systems to ensure that students' memorization remains stable and is not easily lost (Che Wan Mohd Rozali et al., 2022).

The third indicator of memorization quality is murāja'ah, the practice of consistently repeating memorized material to maintain memory stability. Murāja'ah is one of the main principles in learning the tahfiz of the Qur'an, as without continuous repetition, memorization tends to be forgotten over time. Research shows that systematic repetition can improve memory retention and enhance long-term memorization stability (Badran, 2018, p. 59; Umar et al., 2023). Therefore, in many Qur'anic tahfiz institutions, murāja'ah becomes an important part of students' daily learning schedules.

In cognitive science, the process of memorization is closely related to the mechanisms of memory formation in the human brain. Cognitive Learning Theory explains that learning occurs through the process of encoding, storage, and retrieval of information in memory (Zou et al., 2025). This theory emphasizes that memory retention is not only determined by learning intensity, but also by the strategies of repetition and retrieval used during the learning process. In the context of the tahfiz of the Qur'an, the encoding process occurs when students first memorize a verse, and storage occurs when that memorization is consolidated in long-term memory. In contrast, retrieval occurs when students repeat memorization through murāja'ah or tasmi'.

One of the important concepts in cognitive research related to the memorization process is the spacing effect, which is the phenomenon that learning done at a certain time interval results in stronger memory retention compared to learning that is done repeatedly in close proximity (Carpenter et al., 2012; Cepeda et al., 2006, 2008). Spaced learning optimizes memory consolidation by giving the brain time to strengthen memory traces before the next repetition. This concept is very relevant to the practice of murāja'ah in tahfiz learning, which emphasizes periodic repetition of memorization.

Neuroscience research also provides empirical support for the phenomenon. Neuroimaging studies show that spaced learning strengthens memory representations in the brain by re-encoding previously learned information. This process improves the stability of memory representations in brain regions involved in long-term memory formation, particularly the ventromedial prefrontal cortex (Zou et al., 2025). These findings show that spaced learning not only improves memory retention behaviourally but also has a biological basis in the process of memory formation in humans.

Various studies in education also show that spaced learning is effective in improving learning outcomes across disciplines. Studies in medical education, language learning, and professional skills training show that distributed learning, spaced at regular intervals, results in stronger knowledge retention than intensive, single-session learning (Madhi, 2024; Mawson & Kang, 2025). Thus, spaced learning is considered one of the most effective learning strategies in improving long-term memory retention.

Massed learning is a learning strategy that emphasizes intensive practice in a relatively short time. This strategy is often used in the early stages of learning to speed up the acquisition of new material. Research shows that massed learning is effective in increasing the speed of material mastery, but if it is not followed by distributed repetition, memorization tends to be easily forgotten (Ahmad et al., 2024; Greving & Richter, 2021; Wimmer & Poldrack, 2022). Therefore, in the tahfiz Al-Qur'an program, a balance is needed between massed learning to accelerate memorization and spaced learning to maintain memorization stability through murāja'ah.

Another important concept in cognitive learning is retrieval practice, the activity of recalling information to strengthen memory. Retrieval practice is the process by which recalling learned information strengthens memory traces and improves long-term retention (Davies & Mansour, 2022; Yang et al., 2025). In the tahfiz Al-Qur'an program, tasmi' activities and memorization exams are forms of retrieval practice because students are asked to repeat memorized passages without looking at the mushaf. This process not only serves as an evaluation but also as a memory-strengthening mechanism that helps maintain memorization stability.

Some studies have also shown that combining spaced learning and retrieval practice can significantly improve memory stability. The integration of these two strategies allows the process of memory strengthening to be repeated, thereby increasing students' ability to retain information in long-term memory (Carpenter et al., 2022; Dunlosky et al., 2013). This approach is well aligned with the practice of murāja'ah in the Qur'anic tahfiz program, which emphasizes the importance of regular repetition in memorization.

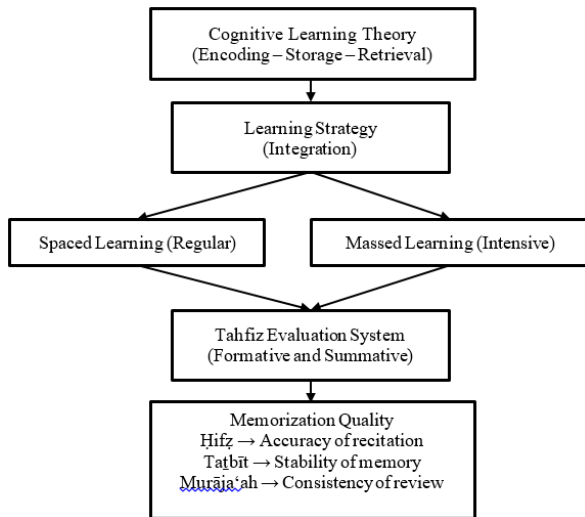
Although research on Qur'anic tahfiz programs is constantly evolving, most studies continue to focus on institutional management, curriculum development, and student learning. Research examining the evaluation of tahfiz programs from the perspective of cognitive learning theory, particularly through the integration of spaced and massed learning strategies, remains relatively limited. In addition, many evaluation systems for the Tahfiz Al-Qur'an program still emphasize memorization quantity rather than cognitive mechanisms that support long-term memorization stability and retention.

Therefore, this study aims to fill this gap by developing an evaluation framework for the Qur'an tahfiz program that integrates cognitive learning theory, spaced learning, and massed learning in improving the quality of Qur'an memorization. By focusing on the dimensions of ḥifẓ, taṭbīt, and murāja'ah, this research is expected to contribute to the development of a more comprehensive, theory-based evaluation system for the Qur'an tahfiz program.

The conceptual framework of this research was built by integrating cognitive learning theory with the evaluation system of the Qur'an tahfiz program. In the perspective of Cognitive Learning Theory, the learning process involves three main mechanisms: encoding, storage, and retrieval (Umar et al., 2023; Zou et al., 2025). The learning strategies used to enhance memorization quality are spaced and massed learning. Massed learning is used to speed up the acquisition of new material in the early stages of learning, while spaced learning is used to strengthen memorization stability through distributed repetition over a given time interval. The integration of these two strategies allows a balance between achieving memorization targets and maintaining long-term memorization stability. The learning strategy is then implemented in the tahfiz program evaluation system which consists of formative and summative evaluation. Formative evaluation includes daily deposits, weekly evaluations, monthly evaluations and per-juz evaluations which aim to monitor the progress of student memorization on an ongoing basis. Meanwhile, summative evaluation is conducted through mid-semester and end-of-semester exams, as well as final tahfiz exams, which aim to comprehensively assess the quality of students' memorization.

The quality of memorization in this study was measured through three main indicators (Badran, 2018, pp. 52–59), namely ḥifẓ (accuracy of reading and memorization), taṭbīt (stability of memorization), and murāja'ah (consistency of memorization repetition). These three indicators represent the dimension of memorization quality that emphasizes not only the number of memorizations but also the accuracy of reading, the durability of memorization in long-term memory, and student discipline in maintaining memorization through continuous repetition.

**Figure 1:** *Conceptual Framework of Cognitive Learning-Based Evaluation of Tahfiz Al-Qur'an Programs: Evidence from Spaced and Massed Learning*



**METHODOLOGY**

This study uses a qualitative case study approach. This approach was chosen because the research aims to understand in depth the implementation of the evaluation of the Tahfiz Al-Qur'an program in the natural context of Islamic education units. The case study allows researchers to explore the phenomenon of evaluating the Qur'an tahfiz program holistically, contextually, and in depth, especially by examining the integration of spaced and massed learning strategies in its practice (Mcmillan & Schumacher, 2014, p. 370).

The research subjects included school principals, vice principals for curriculum and coaching, coordinators of the Tahfiz Al-Qur'an program, Tahfiz Al-Qur'an teachers, and students participating in the program at Integrated Islamic Senior High Schools in Indonesia. The selection of subjects was carried out using purposive sampling, with consideration of the informants' direct involvement, knowledge, and experience in evaluating the Tahfiz Al-Qur'an program. This technique is considered appropriate in qualitative research because it enables researchers to obtain rich, relevant data aligned with the research focus (Creswell, 2015, p. 309). The research instruments included in-depth interviews, observation of the Qur'an tahfiz program, and documentation studies. The interview was used to explore the informants' perceptions, experiences, and views on the evaluation of the Tahfiz Al-Qur'an program. Observations were conducted to directly observe the implementation of memorization programs (murāja'ah) and the application of Spaced and Massed Learning-based repetition patterns. The documentation study examines program documents such as the Qur'an tahfiz curriculum, deposit schedules, evaluation formats, and student memorization achievement reports. The research procedure is carried out through the collection of field data in stages in accordance with the evaluation practice of the Tahfiz Al-Qur'an program. The research stages include field orientation, main data collection, data deepening, and clarification of provisional findings to informants. This gradual procedure allows researchers to reflect on and sharpen their focus continuously, so that the data obtained are more accurate and in-depth in representing the evaluation conditions of the Qur'an tahfiz program being studied (Creswell, 2015, p. 309).

Data analysis was carried out using Creswell's qualitative analysis model, including data organization, thematic coding, category grouping, and the identification of key themes. To ensure data validity, this study applied source and triangulation techniques by comparing interview, observation, and documentation results. The analysis is carried out cyclically and continuously until credible and consistent findings are obtained, with the focus on evaluating Spaced and Massed Learning in Tahfiz Al-Qur'an programs (Creswell, 2015, p. 314).

**FINDINGS**

The study's results show that the evaluation system of the Tahfiz Al-Qur'an program comprises two main forms: formative and summative evaluation. These two forms of evaluation complement each other in maintaining the quality of students' memorization of the Qur'an in a sustainable manner throughout the learning process..

**Formative Evaluation of the Tahfiz Al-Qur'an Program**

Formative evaluation is carried out as a mechanism for controlling a sustainable, tiered quality of memorization. This evaluation is designed to continuously monitor students' memorization progress from the initial stage of ziyādah (addition of memorization) to the achievement of a full juz, while maintaining a balance between quantity and quality. Based on the study's findings, formative evaluation is the primary instrument for maintaining the stability of student memorization in both Spaced Learning (regular) and Massed Learning (takhaṣṣus) classes. Formative evaluation comprises four main stages: daily evaluation, weekly evaluation, monthly evaluation, and one juz evaluation.

**Table 1.1:** Formative Evaluation Structure in the Tahfiz Al-Qur'an Program

Formative Evaluation Type	Frequency	Evaluation Technique	Main Quality Focus
Daily Evaluation	Daily	Ziyādah and murāja'ah assessment	Accuracy of recitation (hifz)
Weekly Evaluation	Weekly	Weekly Tasmi' 3-5 pages	Initial memorization stability
Monthly Evaluation	Monthly	Monthly Random and grouped tasmi' 6-10 pages	Medium-term retention (tatsbīt)
One Juz Evaluation	One Juz	One juz Full tasmi' / random test	Long-term retention

**1.1.1 Daily Evaluation:** Daily evaluation is carried out at every halaqah tahfiz meeting through the deposit of ziyādah and the repetition of murāja'ah. Tahfiz teachers record students' progress in memorization through learning journals and mutāba'ah books that assess fluency in reading, accuracy in makhārij al-ḥurūf, application of tajweed, and notes on memorization improvement. The study's findings show that daily evaluation helps maintain the continuity of student memorization by balancing new and old memorization. In the Spaced Learning class, this evaluation helps maintain the consistency of scheduled repetition so that memorization remains stable. Meanwhile, in the Massed Learning class, daily evaluations help control the intensity of additional memorization, ensuring that accelerated achievement does not compromise the quality of reading or the strength of students' memorization retention.

**1.1.2 Weekly Evaluation:** The weekly evaluation assesses students' accumulated memorization achievements over one week of learning. The weekly evaluation target is set for about one to two pages of new memorization, accompanied by monitoring of murāja'ah discipline. Evaluation is carried out through tasmi' activities for each memorization segment, such as a three- or five-page tasmi'. The tahfiz Al-Qur'an teacher recapitulated the results of the weekly evaluation as a basis for monitoring students' memorization development. The study's findings show that this evaluation serves as an initial indicator of memorization stability and a means of identifying students who need to strengthen their memorization. The weekly evaluation also includes a five-page evaluation, completed in a single tasmi'. This evaluation aims to ensure the quality of memorization from the initial phase of ziyādah. Students are declared able to continue memorization if they reach a minimum score of 75, according to the tahfiz program's standards for completeness.

**1.1.3 Monthly Evaluation:** Monthly evaluations are carried out to assess taḥbīt (memorization stability) in the medium term. This evaluation is carried out through a group tasmi' or random test on memorization obtained over a period of one month with an accumulation target of about six to ten pages. The results of the monthly evaluation are used to map students' memorization skills into the categories of strong, moderate, or require additional reinforcement. This mapping serves as the basis for determining coaching follow-up, such as strengthening murāja'ah, providing special assistance, or adjusting memorization targets. The monthly evaluation also includes a ten-page evaluation, conducted in one sitting by a tasmi' without looking at the mushaf Al-Qur'an.

**1.1.4 One Juz Evaluation:** Evaluation per juz is a decisive formative evaluation stage before students continue memorization to the next juz. This evaluation is done after students complete the memorization of one full juz through tasmī' one juz in one sitting or a proportional random test. The assessment includes the fluency of the recitation, the accuracy of tajweed and makhārij al-ḥurūf, and the strength of memorization retention. The graduation standard is set with a minimum score of 75 according to the school's regulations.

**Table 1.2:** Formative Evaluation Functions Based on Spaced and Massed Learning

Learning Strategy	Evaluation Role	Control Focus
Spaced Learning	Retention reinforcement	Scheduled repetition
Massed Learning	Acceleration control	Segmental filtering
Integrated Strategy	Quality alignment	Continuous monitoring

**1.2.1 Summative Evaluation of the Tahfiz Al-Qur'an Program**

Summative evaluation is conducted to assess final achievements over a given learning period and comprehensively evaluate the attainment of memorization targets. Based on the research findings, summative evaluation consists of four main forms: Mid-Semester Exam (MSE), Final Semester Exam (FSE), Final Tahfiz Exam (FTE), and Special tasmī' exam.

**Table 1.3:** Summative Evaluation Structure in the Tahfiz Al-Qur'an Program

Summative Evaluation Type	Timing	Assessment Scope	Quality Assurance Function
Mid-Semester Exam	Mid-semester	Partial memorization	Progress control
Final Semester Exam	End of semester	Semester target	Memorization consistency
Final Tahfiz Exam	Final year	Large-scale memorization	Graduation quality gate
Special Tasmī' Exam	Conditional / event	Multi-juz recitation	Memorization mastery

**1.3.1 Mid-Semester Examination (MSE)** The Mid-Semester Examination (MSE) is conducted to assess students' memorization progress during the middle of the learning period. The evaluation includes memorization testing, recitation fluency assessment, and tajwid accuracy evaluation. In this examination, students are required to recite approximately half to one juz of memorization in a single session, depending on their memorization progress and the learning strategy implemented.

**1.3.2 Final Semester Examination (FSE)** The Final Semester Examination (FSE) evaluates students' memorization achievements during one semester. The assessment includes memorization tests, recitation evaluations, and written examinations on tajwid theory. The memorization target varies depending on the learning strategy implemented in the program. In general, students are required to recite approximately one and a half juz to three juz of memorization in this examination, adjusted to their level and learning track.

**1.3.3 Final Tahfiz Examination (FTE)** The Final Tahfiz Examination (FTE) is conducted for final-year students as part of the Tahfiz program requirements. The examination includes memorization tests covering several memorization levels, including three juz, seven juz, fifteen juz, twenty juz, twenty-five juz, and thirty juz of the Qur'an.

**1.3.4 Special Tasmī' Examination (STE)** The special tasmī' examination is conducted for students who achieve large memorization targets. The examination may involve recitation of three, five, ten, or fifteen juz of memorization before an examination panel. The assessment focuses on recitation fluency, the accuracy of tajwid application, and the continuity of memorization.

**Table 1.4:** Evaluation Framework of the Tahfiz Al-Qur'an Program Based on Spaced and Massed Learning

Evaluation Type	Evaluation Form	Primary Focus	Dominant Strategy	Memorization Quality Indicators	Evaluative Function
Formative	Daily Evaluation	Initial control of recitation accuracy	Spaced Learning	Accuracy of <i>makhārij al-ḥurūf</i> and <i>tajwīd</i> (hifz)	Early detection of errors
Formative	Weekly Evaluation	Short-term memorization stability	Spaced Learning	Fluency of recitation, minimal errors	Consistency reinforcement
Formative	Monthly Evaluation	Medium-term retention	Spaced Learning	Stability of memorization ( <i>tatsbīr</i> )	Forgetting prevention
Formative	One Juz Evaluation	Validation of readiness to proceed	Spaced & Massed Learning	Accuracy, fluency, and endurance	Formative quality gate
Summative	Mid-Semester Exam	Semester progress control	Massed Learning	Alignment with semester targets	Achievement monitoring
Summative	End-of-Semester Exam	Consolidation of learning outcomes	Massed Learning	Consistency of memorization quality	Quality standardization
Summative	Final Tahfiz Examination	Validation of Tahfiz completion	Massed Learning	Long-term retention	Final quality assurance
Summative	Special Tasmī' Examination	Public validation of <i>mutqīn</i> memorization	Spaced & Massed Learning	Stability of large-scale memorization	Legitimacy and accountability
Summative	Remedial	Targeted improvement	Spaced Learning	Correction of memorization weaknesses	Quality recovery

**1.3.5. Remedial**

Remedial activities are conducted for students who do not meet the minimum memorization standards in formative or summative evaluations. The remedial process includes additional memorization guidance, intensive murāja'ah assignments, individual mentoring by Tahfiz teachers, and participation in Tahfiz quarantine programs. The remedial process continues until students achieve the memorization standards determined by the Tahfiz.

**Table 1.5:** Quality Indicators Assessed in Tahfiz Al-Qur'an Program Evaluation

Indicator	Operational Meaning	Assessment Method
Hifz (Accuracy)	Correct makhārij and tajwid	Direct tasmī'
Hifz (Fluency)	Minimal hesitation	Recitation observation
Taṭbīr (Stability)	Retention across time	Random recall
Murāja'ah consistency	Regular revision discipline	Monitoring log

**DISCUSSION**

**1. Strengthening Qur'anic Memorization through Spaced and Massed Learning Strategies**

The study's findings show that integrating spaced and massed learning strategies into the evaluation of the Tahfiz Al-Qur'an program significantly improves the quality of student memorization. The evaluation system, carried out in stages, allows memorization to strengthen gradually, systematically, and continuously. Formative evaluation carried out through daily memorization deposits, periodic murāja'ah, and reading quality monitoring functions as a memory-strengthening mechanism that maintains the stability of students' memorization. Through the evaluation process, Qur'an tahfiz teachers can monitor the progress of students' memorization as well as provide the necessary feedback to correct reading errors or weaknesses in memorization (Amabile et al., 2021; Davies & Mansour, 2022; Dunlosky et al., 2013; Zhou et al., 2025). On the other hand, summative evaluations such as the tasmī' exam and the juz ascension exam serve as a quality control mechanism to ensure that students' memorization not only meets the quantity target but also demonstrates good reading quality and strong memorization stability. With a structured summative evaluation, educational institutions can maintain the quality standards for memorization of the Qur'an, ensuring that students not only achieve the target number of memorized verses but also retain memorization for a longer period. This approach is in line with the concept of retrieval-based learning, which emphasizes that the process of repeated evaluation can strengthen memory retention and improve long-term knowledge stability (Carpenter et al., 2022; Ranjbar et al., 2024; Yang et al., 2025).

From a cognitive perspective, memory stability is strongly influenced by the frequency of repetition and the time interval between repetitions. Research shows that learning through repeated repetitions spread over a given time interval can significantly improve long-term memory retention compared to continuous learning without pauses (Cepeda et al., 2008; Mawson & Kang, 2025). A distributed repetition pattern allows the brain to carry out the memory consolidation process more optimally so that the information learned can be stored more stably in long-term memory (Kukushkin et al., 2024; Wollstein & Jabbour, 2022; Zhou et al., 2025).

Neuroscience findings also show that spaced learning strengthens memory representations through re-encoding, a process of memory re-reinforcement that occurs when information is relearned after a certain time interval. This process strengthens neural connections that support long-term memory stability. Neuroimaging studies show that diffuse repetition can improve memory representation in the ventromedial prefrontal cortex, which plays an important role in long-term memory consolidation. Thus, the repetition of memorization carried out in a distributed manner not only improves students' memory skills but also strengthens the quality of cognitive processing of the memorized information (Hanafi et al., 2021; Kapeniaks & Kapeniaks, 2021; Wimmer & Poldrack, 2022).

In the context of tahfiz education, the integration of the strategy supports the achievement of three main dimensions of memorization ability: *hiḏ* (memorization accuracy), *taḡbīt* (memorization stability), and *murāja'ah* (continuous repetition of memorization). These three dimensions are the main indicators of the success of tahfiz learning, as the quality of Qur'an memorization is not measured solely by the number of verses memorized but also by the ability to maintain memorization consistently over the long term (Badran, 2018, pp. 52–59). Research on tahfiz education also shows that the success of tahfiz programs is greatly influenced by a structured learning system, support of the educational environment, and learning strategies that can maintain a balance between the achievement of memorization quantity and the quality of memorization (Che Wan Mohd Rozali et al., 2022; Ishak et al., 2022).

## 2. Evaluation System as a Mechanism for Maintaining the Quality of Tahfiz Al-Qur'an Programs

The study's results show that a structured evaluation system plays an important role in maintaining the quality of the Tahfiz Al-Qur'an program. The evaluation is carried out in stages, allowing program managers to monitor students' memorization progress in real time and identify difficulties they encounter during the process. Thus, evaluation not only serves as a tool for measuring learning outcomes but also as a quality control mechanism in tahfiz program management (Arifin et al., 2025; Nasrulloh et al., 2022; Rajagede & Hastuti, 2021).

Through regularly conducted formative evaluations, tahfiz teachers can determine students' mastery of memorization and provide guidance tailored to each student's needs. Formative evaluation also allows teachers to detect early reading errors or weaknesses in memorization mastery, so improvements can be made more quickly and effectively. Research in educational evaluation indicates that a continuous evaluation system can improve learning quality and provide decision-making information for educational management (Droulers et al., 2026; Z. Yan et al., 2021).

These findings are in line with research showing that the quality of Qur'anic tahfiz education is greatly influenced by a structured program management system, including *murāja'ah* timing, memorization evaluation system, and the competence of Qur'anic tahfiz teachers (Arifin et al., 2025; A. Othman et al., 2024). Tahfiz programs with a clear evaluation system tend to maintain a balance between the quantity of memorization and the quality of student memorization.

In addition, other research shows that the management system of the Qur'an tahfiz program should also focus on students' motivation to ensure optimal memorization. The development of Qur'anic tahfiz education modules that integrate aspects of learning and student motivation has been proven to improve the quality of the overall Qur'an tahfiz program (Alnajashi et al., 2025; Ishak et al., 2022).

From an educational management perspective, the evaluation system also serves as a tool to ensure that the Tahfiz Al-Qur'an program runs effectively and efficiently. Program evaluation enables educational institution managers to assess the program's success and make necessary improvements to enhance the quality of the Tahfiz Al-Qur'an program (Astuti, 2024; Nasrulloh et al., 2022).

## 3. Integrating Cognitive Learning Theory into the Tahfiz Al-Qur'an Program

The findings of this study show that the cognitive science approach can make an important contribution to the development of the Qur'anic tahfiz learning model. Cognitive learning theory explains that the learning process is strongly influenced by memory mechanisms, information repetition, and retrieval processes that occur when a person recalls learned information (Ardiansyah et al., 2024; Hanafi et al., 2021).

In the context of tahfiz learning, the *murāja'ah* process reflects the principle of retrieval practice, which involves recalling information to strengthen memory retention. Research shows that retrieval practice is among the most effective learning strategies for improving long-term memory retention (Los et al., 2021; Yang et al., 2025).

In addition, various experimental studies have shown that spaced learning can significantly improve knowledge and skill retention compared to massed learning. Experimental studies on complex skills training showed that participants who trained with a spaced-learning pattern retained skills better than those who trained intensively without sufficient time intervals (Ahmad et al., 2024; Madhi, 2024; Tarmuji et al., 2022).

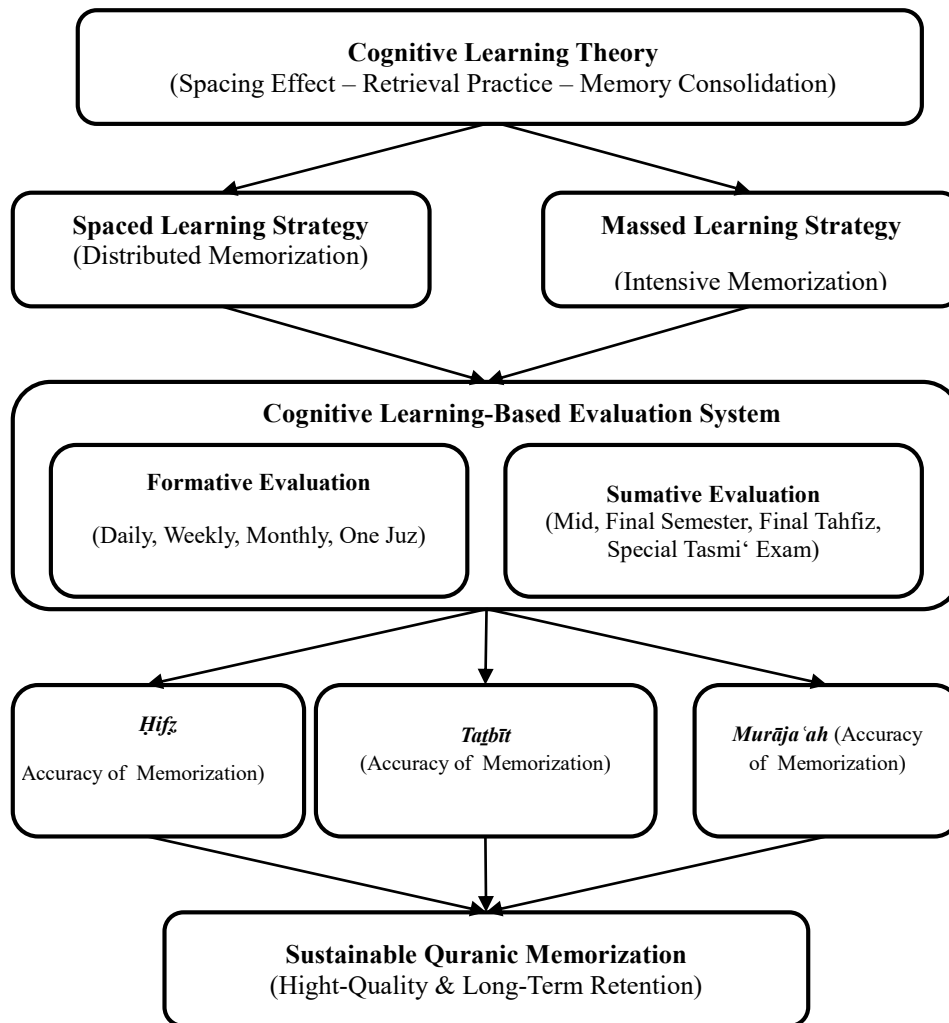
These findings suggest that the principles of cognitive psychology fit well with the Qur'anic tahfiz programs that have developed in the Islamic world, particularly the practices of *tikrār*, *murāja'ah*, and *tasmi'*, which emphasize continuous repetition and reinforcement of memorization (Yusof et al., 2025).

## 4. Theoretical Contribution to Tahfiz Al-Qur'an Program Research

Theoretically, this research makes an important contribution to the evaluation of the Tahfiz Al-Qur'an program by integrating the concept of cognitive learning theory into the Qur'an learning system. This research shows that traditional practices in tahfiz education, such as *murāja'ah*, are compatible with scientific concepts in cognitive psychology, particularly spacing effects and retrieval practices (Caffrey & Commins, 2023; Carpenter et al., 2012; Pla-Mauri & Solé, 2025). In addition, this research also offers a conceptual framework that connects learning strategies with the quality of Qur'an memorization. Within this framework, spaced learning strengthens the *murāja'ah* process, *murāja'ah* strengthens *taḡbīt* (memorization stability), and memorization stability contributes to the overall *hiḏ* (quality of Qur'anic memorization). The conceptual model can be described as follows:

Figure 2

*Cognitive Learning-Based Evaluation Model in Tahfiz Al-Qur'an Programs: Evidence from Spaced and Massed Learning*



The Model of this study integrates principles from cognitive learning theory with the evaluation of Tahfiz Al-Qur'an programs. The framework illustrates how spaced learning and massed learning strategies function as complementary approaches in Qur'anic memorization. Spaced learning emphasizes distributed repetition over time, which supports long-term memory consolidation, while massed learning facilitates intensive memorization within shorter learning periods. Both strategies are implemented within the Tahfiz learning process, which includes halaqah sessions, memorization submission, and structured murāja'ah. The effectiveness of this learning process is reinforced through a systematic evaluation system, consisting of formative evaluation, such as daily memorization monitoring and periodic murāja'ah, as well as summative evaluation, including the Mid-Semester examination, Final Semester examination, Final Tahfiz examination, and Special tasmi' examination.

Through this evaluation system, the learning process contributes to the development of three essential dimensions of Qur'anic memorization: hifz (accuracy of memorization), taḥbīt (stability of memorization), and murāja'ah (consistency of revision). The integration of these components ultimately leads to high-quality Qur'anic memorization that is both accurate and sustainable over time.

##### 5. Implications and Limitations of the Study

This research has several important implications for the development of the management of the Tahfiz Al-Qur'an program. In practice, this study shows that integrating spaced and massed learning strategies into the evaluation system of the Qur'an tahfiz program can systematically and sustainably improve the quality of student memorization. Therefore, Islamic educational institutions can develop an evaluation system that integrates the repetition of memorization in a structured manner with clear memorization targets. Theoretically, this research contributes to the development of an interdisciplinary study of Islamic education and cognitive psychology. This research shows that principles in cognitive science can be applied in tahfiz programs to improve the stability of Qur'an memorization. However, this study has some limitations. First, this study uses a case study approach in one educational institution, so generalization of the research findings to other Islamic education institutions needs to be carried out. Second, this study has not examined in depth the neurocognitive mechanisms underlying the strengthening of memorization of the Qur'an. Therefore, further research can integrate neuroscience approaches to understand further how the process of memorization repetition affects long-term memory formation. Advanced research can also use a longitudinal design to assess the stability of students' memorization over a longer period, enabling a more comprehensive analysis of the effectiveness of spaced learning strategies in maintaining the quality of Qur'an memorization.

##### CONCLUSION

This study found that integrating Spaced Learning and Massed Learning strategies into the evaluation system of the Tahfiz Al-Qur'an program effectively strengthens the quality of student memorization by enhancing memory retention and structured memorization repetition. A tiered evaluation system that includes formative and summative evaluations has been proven to maintain hifz (accuracy of reading and memorization), taḥbīt (memorization stability), and consistency in students' murāja'ah during the tahfiz learning process. The study's findings show that integrating cognitive science-based learning strategies with the Tahfiz program evaluation system can be an effective evaluation model to improve the quality of the Tahfiz Al-Qur'an program in Islamic educational institutions. This study enriches the evaluation of the Tahfiz Al-Qur'an program by integrating Spaced and Massed Learning strategies within a structured evaluation system. These findings have practical implications for Islamic educational institutions seeking to improve the quality of student memorization. Further research is needed to test this model across various contexts of tahfiz institutions to strengthen the validity and generalizability of the findings.

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