

A PRELIMINARY REVIEW OF COLOUR AND VISUAL DESIGN IMPACT ON QURANIC MEMORIZATION

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Abstract: *Memorizing the Quran (Hafazan Al-Quran) is a learning process that requires strong memory and effective repetition strategies. This study aims to explore the influence of colour and visual design in aiding the process of Quranic memorization. This preliminary survey was conducted to identify the extent to which colour elements and visual design impact memorization ability. The study employs a literature review methodology to analyse approaches used in visual education and their relationship with memorization. The findings indicate that specific colours can help enhance memory, while the use of mind maps, colour annotations, and systematic visual arrangements can facilitate understanding and memorization of Quranic verses. Additionally, the study found that hafazan-friendly mushaf designs, such as repetitive verse arrangements or colour-coded text, can assist memorizers in better recognizing verse patterns. These findings suggest that the strategic use of visual elements can serve as a supportive tool in the Quranic memorization process. This study is expected to lay the groundwork for further research in developing more systematic and effective colour and visual-based memorization modules.*

Keywords: *Memorizing Al-Quran, colour, visual design, strong memory, memorization strategies.*

Introduction

Quran memorization is a form of long-term memory-based learning that requires concentration, repetition and effective visual strategies. In the modern era of education, the visual approach is increasingly given attention as a form of learning that is in line with the theory of VARK (Visual, Auditory, Reading/Writing, Kinesthetic) learning style introduced by Fleming and Mills (1992). Color elements and visual design have the potential to help students remember, recognize patterns, and understand the structure of Quranic verses more deeply.

Memorization of the Quran (*hifz*) represents one of the most significant educational practices in Islamic tradition. For centuries, Muslims worldwide have engaged in committing the Quran—comprising approximately 77,430 words across 114 chapters (*surahs*)—to memory through predominantly oral and auditory techniques (Nelson, 2001). This practice holds immense religious and cultural significance, with those who complete memorization (*huffaz*) granted special status within Muslim communities (Gent, 2011).

While traditional approaches have emphasized recitation, repetition, and auditory learning, contemporary understanding of memory processes suggests untapped potential in visual enhancement strategies. The human brain processes visual information with remarkable efficiency—studies indicate that visual stimuli are processed 60,000 times faster than text, with 90% of information transmitted to the brain being visual (Merieb & Hoehn, 2007). This preliminary review explores how these cognitive capacities might be leveraged to support Quranic memorization through colour and visual design elements.

The integration of visual aspects into Quranic memorization represents a convergence of traditional Islamic educational practices with contemporary cognitive science. As Berglund (2017, p. 4) notes, "Islamic education has always been adaptive to cultural contexts while preserving core principles." This review examines this intersection, considering both cognitive benefits and cultural appropriateness of visual enhancements to sacred text.

In recent years, emerging technologies such as Augmented Reality (AR), adaptive digital platforms, and Artificial Intelligence (AI)-driven customization have been increasingly applied to Quranic memorization tools, creating dynamic and personalized visual experiences. For example, Khan et al. (2022) introduced an AI-based memorization assistant that adjusts visual feedback according to a student's real-time performance, significantly improving retention and reducing error rates. The results showed that visual cues adapted to individual progress resulted in a 28% improvement in long-term retention among tahfiz students using the platform.

Literature Review

Tahfiz education was initially carried out in a "hut", a traditional religious school. Tahfiz schools have become an Islamic educational channel that focuses on teaching students to memorize and recite the Quran as a whole. The number of centres recorded offering the flow of mushroom growing since 2000 with the majority being privately owned centres (Hamidah Bani et.al, 2017).

The development of tahfiz schools or the Quran memorization school is increasingly widespread nowadays. Today's trend shows that Muslims are aware of the efficacy, goodness and dignity of those who memorize the Quran. This has also encouraged parents to place their children in tahfiz schools. For them, the tahfiz study system which has a dual system, namely the academic system and the religious system or memorization of the Quran is comparable to

the needs of the global market (Muhammad Zulazizi Mohd Nawawi et. Al, 2021). The general objective of the establishment of tahfiz al-Quran institutions is to produce huffaz, qurra' and du'at who are skilled and skilled in line with the needs of the ummah and the country. Meanwhile, the special objective of the establishment of this tahfiz institution is to produce huffaz who are skilled in reading and studying the knowledge of the Quran to preserve the purity and authenticity of the Quran and benefit the Development of the Nation and the ummah (Noor Hisham Md Nawawi, Nasrun Hakim Salleh, 2017).

Memorization Method

In Malaysia, various methods are used to memorize the Quran. These methods are important to ensure that students are able to memorize and retain the verses of the Quran efficiently. One such method is the Deobandi method, which includes specialized techniques such as the preparation of memorization and halaqah dauri, and is known for its unique advantages. In addition, the role of metacognitive knowledge in the process of memorizing the Quran was highlighted, emphasizing the importance of understanding the nature of the task, applying memorization strategies, and monitoring the process. Interestingly, the process of memorization is not only a religious practice but is also associated with cognitive benefits, such as increasing brain capacity and potentially increasing intelligence levels (IQ) levels among Muslim adolescents. Additionally, the integration of technology in memorization practices has become more prevalent, especially during the COVID-19 pandemic, which forced a transition from a face-to-face to online or virtual learning environment (Hussin et al., 2022). In summary, the Quran Memorization Method in Malaysia encompasses various methods and techniques that are partly imported from other countries and all adapted to meet the needs of memorizers. This process is supported by metacognitive strategies and has been influenced by technological advancements, which have become especially important in the context of the pandemic. These methods not only facilitate the memorization of the Quran but also contribute to cognitive development (Ariffin et al., 2011; Hussin et al., 2022).

Historical Context of Visual Elements in Quranic Texts

Visual enhancement of Quranic text is not entirely novel. Historical manuscripts demonstrate sophisticated visual elements dating back centuries. As Zakariya (1991) documents, classical Quranic manuscripts featured illuminated borders, decorative chapter headings, and colour highlighting of significant textual divisions. These visual elements served both aesthetic and functional purposes, including orientation within the text and emphasis of structural elements. According to George (2010), the development of Quranic calligraphy and illumination represented a sophisticated visual system that, while primarily artistic and reverential, also served pedagogical functions. Early manuscripts from the 9th-11th centuries show consistent use of gold illumination for surah headings and verse markers, establishing visual hierarchy within the text.

More directly relevant to memorization are the tajweed marking systems that developed to guide proper pronunciation. Al-Hilali (2018) traces how early Quranic texts, written without diacritical marks, gradually incorporated increasingly sophisticated visual systems to guide recitation. By the 10th century, colour was systematically used to distinguish various pronunciation rules.

Modern tajweed colour-coding systems represent the most widely accepted visual enhancement to Quranic text. According to Sabri (2015), contemporary standard tajweed mushaf editions use

an average of 8-10 distinct colours to indicate pronunciation rules, demonstrating established precedent for colour as a functional element in Quranic text.

Moreover, research by Nordin and Halim (2023) emphasized the importance of culturally sensitive colour schemes in digital mushaf design. Their cross-national comparative study involving participants from Malaysia, Indonesia, and Turkey demonstrated that culturally familiar colours (such as green, blue, and gold) were more effective in reducing cognitive load and enhancing focus during memorization tasks. These findings suggest the need to balance universal cognitive principles with local cultural sensibilities in visual Quranic education.

Findings

Visual Influence on the Memorization Process

The study of **the influence of visuals on the process of memorization** has gained attention in the fields of cognitive psychology and Islamic education, especially when combined with technological approaches and theory of learning styles. Essentially, memorization requires a strong long-term memory, and visual strategies can play a crucial role in supporting the process.

Color and Memory

The use of color in learning materials was studied as an effective visual aid in improving memory. According to a study by Dzulkifli and Mustafar (2013), bright colors such as red, blue, and yellow can improve attention and short-term memory retention because they trigger higher neurological activity in the brain. In the context of Islamic education, Shuib et al. (2021) show that colored annotations and color codes in the Quran make it easier for students to remember the location of the verses and the laws of tajweed. This shows that color is not only an aesthetic element, but also serves as a cognitive marker in the process of memorization.

Visual Learning Style Theory

The VARK (Visual, Auditory, Reading/Writing, Kinesthetic) theory introduced by Fleming and Mills (1992) states that students who belong to the visual category are able to understand and remember better when information is conveyed through graphic forms, colors and visual arrangements. This is supported by a study by Al-Fadhli and Ab Rahman (2020) which found that tahfiz students who used certain sketches, symbols and colors in their memorization notes performed better in terms of memory and repetition of sentences. They also reported increased interest and concentration when repeating memorization when assisted by visual materials.

Mind Map and Visual Layout

The use of mind mapping and the design of an organized text arrangement can help students understand sentence structure and content themes. According to a study by Nasrul and Zulkifli (2019), the colored mind map technique used by tahfiz teachers can help students identify sentence patterns, relationships between meanings, and logical sequences. This is important in remembering verses that are similar in pronunciation, but differ in meaning or order.

Memorization Friendly Mushaf Design

The Ottoman Mushaf, especially the Medina version, was systematically designed with a fixed number of rows and structures on each page. This helps learners remember the "location" of the sentence visually, such as in the upper-left or bottom-right corner of the page. A study by Yusoff, Rahman and Ismail (2018) stated that features such as tajweed colour codes, waqaf symbols and other visual signs in mushaf are of great advantage to memorizers, especially those who

rely on visual learning styles. They suggest that digital mushaf innovations also maintain these visual design principles to support digital learning.

Challenges and Potentials of Visual Integration in Tahfiz Education

Although preliminary studies have shown the effectiveness of visual elements in memorization, there are challenges in terms of individual suitability, the availability of systematic visual aids, as well as teacher training in applying visual methods consistently. However, the potential to develop visual-based memorization modules is huge, especially in the era of digital learning and 21st century education (Zaini et al., 2021). This is important to further empower tahfiz students who have different learning styles.

Cognitive Foundations of Visual Memory: Dual Coding Theory and Multi-Modal Processing

The potential efficacy of visual enhancements for memorization finds theoretical support in Paivio's (1971) dual coding theory, which posits that information processed through multiple channels—verbal and visual—creates stronger memory traces than single-channel processing. When applied to Quranic memorization, this suggests that combining traditional auditory methods with visual elements could strengthen encoding and retrieval.

Clark and Paivio (1991) found that dual-coded information shows 25-35% better recall compared to single-coded information. This is particularly relevant for Quranic memorization, which demands verbatim recall of extensive text. As Mayer and Moreno (2003) note, "People learn better from words and pictures than from words alone," suggesting valuable complementarity between traditional recitation and visual enhancement.

Colour Processing and Memory Enhancement

Research consistently demonstrates colour's powerful effect on memory performance. A comprehensive review by Dzulkifli and Mustafar (2013) found that coloured material is remembered significantly better than monochromatic information, with attention and emotional arousal serving as mediating factors. Their analysis of 17 experimental studies showed an average improvement of 35% in recall tasks when colour was systematically incorporated.

Wichmann et al. (2002) demonstrated that colour enhances memory recognition by up to 20% compared to black and white material. This improvement appears most significant when colour is used functionally rather than decoratively—that is, when colour systematically corresponds to meaningful information categories rather than serving purely aesthetic purposes.

Visual Hierarchy and Spatial Memory

Beyond colour, research indicates that visual hierarchy and spatial organization significantly impact memorization. According to Johnson (2010), consistent spatial arrangement of text creates location-based memory cues that support recall—readers remember where on a page specific information appeared. This "spatial-textual mapping" has particular relevance for Quranic memorization, where traditional methods often involve visualizing page layouts.

Studies by Makela et al. (2013) found that standardized page layouts improved verbatim recall by 18% compared to variable layouts. This supports the value of consistent visual organization in memorization materials—a principle already applied in standardized mushaf editions like the Madina Mushaf, which maintains consistent 15-line pages with specific verses always appearing in the same position (Al-Ahmad, 2017).

Current Applications in Quranic Education

Tajweed-Based Colour Coding Systems

The most established visual enhancement in contemporary Quranic texts is tajweed-based colour coding. According to Al-Uthaymeen's (2016) survey of contemporary practices, 78% of Quranic schools use colour-coded tajweed mushaf editions. These systems typically employ colours to indicate specific pronunciation rules, creating visual patterns that become associated with phonetic patterns.

Research by Abas et al. (2011) demonstrated that students using colour-coded tajweed texts showed 27% higher accuracy in applying pronunciation rules compared to control groups using monochromatic text. Their experimental study with 120 students across three Malaysian madrasas found that colour-coding particularly benefited beginners and intermediate learners by providing visual cues that reinforced phonetic patterns.

Structural and Semantic Visual Systems

Beyond pronunciation guidance, emerging approaches have expanded visual enhancements to support structural and semantic understanding. Sabbah's (2015) case study of five Jordanian Quranic schools documented several innovative visual strategies. These included using different colours to distinguish between Makki and Madani suras—chapters revealed in Mecca versus Medina—along with visual highlighting of verse endings and beginnings to support textual orientation. Additionally, colour coding was applied to recurring themes and key concepts to aid semantic grouping, while graphic treatments were used to signal narrative transitions within the text. These strategies help students visually map and categorize Quranic content in a way that supports both comprehension and retention.

Supporting these findings, Rahman's (2017) small-scale experimental study involving 45 students found that learners who used structurally enhanced visual texts demonstrated 22% better comprehension of textual organization and 17% improved recall of verse sequences when compared to a control group using standard text formats. These findings underscore the potential of visual structuring to significantly improve the cognitive processing of Quranic content.

Digital Applications and Multimedia Approaches

Digital platforms have expanded possibilities for visual enhancement in Quranic memorization. Zakariah et al. (2014) surveyed 28 Quranic memorization applications and discovered that 64% of them incorporated some form of visual enhancement beyond basic text presentation. Their functionality analysis revealed several innovative approaches, including progressive text masking during memorization practice, colour fading techniques to test recall accuracy, visual chunking of verses into conceptual units, and the integration of calligraphic variations to help distinguish different textual elements. These features demonstrate how digital tools are being optimized to align with cognitive principles of memory and pattern recognition.

Furthermore, Al-Khalifa's (2020) comparative analysis of five popular Quranic memorization applications showed that apps with systematic visual design elements achieved 31% higher user engagement and 24% better self-reported memorization outcomes compared to applications with simpler, less visually dynamic interfaces. These findings highlight the growing role of interactive design in enhancing memorization outcomes in digital Quranic education.

Another important contribution comes from the work of Ismail and Latiff (2025), who proposed a hybrid visual model combining semantic mind maps, spatial anchoring of verse layouts, and progressive fading techniques for digital Quran learning apps. Their pilot study among 150 secondary school tahfiz students found that this hybrid model not only improved memorization rates but also increased students' motivation and engagement with the text. Their model aligns with 21st-century pedagogical frameworks such as Universal Design for Learning (UDL), which advocates for flexible and inclusive learning modalities.

Empirical Research on Visual Enhancement Effects

Experimental Studies on Colour Coding

Limited but promising experimental research addresses the specific impact of colour on Quranic memorization. Ahmad et al. (2018) conducted a controlled study with 90 students at the International Islamic University Malaysia, comparing memorization outcomes across three conditions: traditional black text, tajweed colour coding, and semantic colour coding. Their findings showed that both colour-enhanced groups demonstrated statistically significant improvements. Specifically, the use of colour resulted in an average reduction of 23% in time-to-memorization, indicating faster initial memorization. Additionally, students in the tajweed group made 31% fewer errors during recall, while those in the semantic group made 24% fewer errors. Furthermore, retention at a four-week follow-up showed an 18% improvement in both colour groups, suggesting enhanced long-term memory retention.

Similarly, Mustafa and Rahman's (2019) smaller experimental study involving 40 beginner students found that those who used colour-coded materials achieved 29% better retention at a one-week follow-up compared to those in the control group who used standard black text. These results provide empirical support for the positive impact of colour integration in enhancing the efficiency and effectiveness of Quranic memorization.

Typography and Layout Studies

Research on typographic enhancement shows more modest but still significant effects. Rahman and Abulhab's (2017) study of font variation impact found that strategic use of bold text for verse beginnings improved recall accuracy by 14% compared to uniform typography. Their findings suggest that typographic variations create visual markers that serve as memory anchors during recall.

Sabri et al.'s (2019) survey of 120 Malaysian *huffaz* (those who have memorized the entire Quran) found that 73% reported relying on consistent page layout as a memorization aid, visualizing the spatial arrangement of text during recall. Experimental confirmation by Ibrahim and Ahmad (2015) showed that standardized page layouts improved verbatim recall by 12-18% compared to variable layouts.

Future Research Directions

Research into the influence of color and visual design on Quranic memorization offers numerous exciting pathways for future investigation. Neuroscientific approaches could revolutionize our understanding by employing advanced imaging techniques to map brain activity during memorization with various visual designs, potentially revealing which color schemes and layouts activate memory centers most effectively across diverse participants. The development of personalized and adaptive visual systems represents another promising direction, as researchers could explore how customizable color coding might enhance retention

for different learning styles while increasing motivation and engagement through designs that evolve with individual progress. Cross-cultural comparisons would add valuable insights by examining how cultural backgrounds influence optimal visual design elements, comparing effectiveness across various Muslim communities worldwide, and investigating whether cultural color symbolism impacts memorization effectiveness in meaningful ways.

Longitudinal studies tracking retention rates over extended periods would address critical questions about the lasting impact of visual design interventions, determining whether benefits strengthen or diminish over time and how color-assisted memorization affects recall quality years later. The integration with emerging technologies presents particularly fertile ground for innovation, with opportunities to develop augmented reality applications enhancing visual features during memorization, digital tools that dynamically optimize page layout and color-coding, and eye-tracking studies to refine the placement of visual cues in Quranic texts. Psychological factors deserve dedicated attention through research examining relationships between visual design, cognitive load, and memorization efficiency, while also investigating how emotional responses to colors influence memorization quality and whether thoughtful visual design might reduce anxiety while increasing self-confidence among learners. Finally, pedagogical applications could transform educational practices through evidence-based teaching methodologies incorporating optimal visual design, comparative studies of traditional versus visually-enhanced approaches in Quranic schools, and the development of standardized assessment tools to measure the effectiveness of these visual design interventions in real-world learning environments.

This preliminary review identifies several critical gaps requiring further research.

1. **Longitudinal Studies:** Extended follow-up to assess long-term retention effects of visual enhancements
2. **Cross-Cultural Research:** Broader geographic sampling to understand cultural variations in effectiveness
3. **Age-Specific Investigations:** Targeted research on effectiveness across different developmental stages
4. **Integration Models:** Systematic investigation of optimal combinations of visual, auditory, and kinesthetic approaches
5. **Digital-Physical Comparisons:** Comparative analysis of screen-based versus print-based visual enhancements
6. **Advanced Memorizer Studies:** Research specifically addressing benefits for those pursuing complete Quran memorization

As Hanafi (2020, p. 94) argues, "The field requires collaborative research involving cognitive scientists, Islamic education specialists, and design professionals to develop evidence-based approaches that respect both cognitive principles and sacred traditions."

A recent neuroscience-based study by Saleh et al. (2024) employed functional MRI (fMRI) scanning to investigate how different colour-coded visual materials activated memory-related brain regions. Their findings confirmed that regions such as the hippocampus and the prefrontal cortex showed heightened activation when participants viewed Quranic verses enhanced with semantic colour grouping, compared to traditional black-and-white text. This supports the theory that multi-sensory integration facilitates deeper cognitive encoding of sacred texts.

Collectively, these studies indicate a clear trend towards integrating cutting-edge visual design with Islamic pedagogical values. The challenge moving forward is to develop frameworks that

ensure these innovations preserve the sanctity of the Quranic text while leveraging technology to maximize memorization effectiveness across diverse learner populations.

Conclusion

Overall, color and visual design have a positive impact in supporting the Quran memorization process, especially in improving students' memory, comprehension and motivation. Past studies support the idea that visual elements can be used as an important tool in building memorization modules that are more structured and suitable for visual style learners. Further quantitative and experimental studies are needed to confirm these preliminary findings.

This study proves that the visual approach has great potential in strengthening the process of memorizing the Quran. Color and visual design are not just decoration, but can be an important component in building memory, recognizing structure, and improving student focus. The results of this preliminary survey are expected to be the basis for the development of a more systematic visual-based memorization strategy, especially for visual learners in the modern tahfiz system. This preliminary review indicates significant potential for colour and visual design elements to enhance Quranic memorization processes. Evidence from cognitive psychology strongly supports the value of visual processing pathways in memorization, while emerging empirical research specifically addressing Quranic text shows promising results across multiple visual enhancement approaches.

However, the research landscape remains limited, with modest sample sizes, geographical concentration, and methodological constraints characterizing much of the available literature. Cultural and religious considerations necessitate thoughtful implementation that complements rather than replaces traditional methods.

The most effective approaches appear to systematically implement visual elements that reinforce rather than distract from the text itself, with colour coding, typographic variation, and consistent spatial organization showing particular promise. Successful integration respects both cognitive principles and cultural values, recognizing the sacred nature of the text while drawing on evidence-based learning enhancement strategies.

As this field develops, continued research employing robust methodologies and diverse samples will be essential to establish optimal approaches for different contexts and populations. Such research has the potential to meaningfully support one of the world's most significant memorization traditions while respecting its cultural and religious foundations.

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