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Narrating Arabic Reading in the Digital Age: A Narrative Inquiry into Generation Alpha Learning in Indonesian Pesantren

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ABSTRACT

Background: Traditional linear Arabic language instruction in Indonesian Islamic boarding schools (*pesantren*) faces a cognitive mismatch with Generation Alpha. Although technology has been adopted, current literature has not yet explored how students' subjective experiences bridge classical texts with their digital cognitive habits.

Objective: This study aims to explore the learning experience narratives of teachers and students in implementing a pedagogical framework that bridges classical Arabic texts with the visual-digital logic of the contemporary generation.

Methods: This research employs a qualitative case study design with a narrative approach. Data were collected through participant observation and in-depth interviews with four students and two teachers. The thematic analysis method by Miles, Huberman, and Saldaña was utilized to deconstruct the flow of subjects' experiences and reflections.

Results: The study reveals that Generation Alpha possesses a dominant intuitive-visual literacy inclination in processing information. Participant narratives indicate that the "creative-hybrid bridge" strategy, which integrates digital aesthetics into classical texts, successfully transformed the learning experience from passive rote memorization into active, game-based discovery. The findings highlight an enrichment in reading comprehension quality and the growth of learner autonomy rooted in the synchronization of materials with the students' visual logic.

Conclusion: The proposed pedagogical interface model provides a theoretical contribution to digital language pedagogy within traditional environments. This model proves that integrating digital cognitive architecture into classical materials can sustain linguistic traditions without losing substantive depth for future generations.

KEYWORDS

Arabic Language Learning, Generation Alpha, Pedagogical Interface, Pesantren Education, Qualitative Case Study

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INTRODUCTION

The landscape of Islamic education in Indonesia is currently confronting a paradoxical clash between centuries-old intellectual traditions and the swiftest cognitive revolution in human history. On one hand, Arabic language instruction within *pesantren* remains historically rooted in the grammar-translation method through the study of *kitab kuning*, classical texts that demand a high degree of cognitive persistence (Pink, 2020) However, the stability of this tradition is now threatened by a palpable cognitive

dissonance arising from the emergence of Generation Alpha digital natives whose modes of thought have been entirely formatted by technological integration since birth (Amin, 2025; Ramadhani et al., 2026). The core of this issue lies in a profound methodological chasm: theoretically, Arabic language mastery has long been viewed as a linear process heavily reliant on long-term memory and rigid grammatical deduction (Alzughaibi, 2024; Hodges et al., 2024), In reality, these pedagogical expectations clash violently with the reality of Generation Alpha, who possess a highly visual, interactive learning preference and shorter attention spans, requiring dynamic multimodal stimulation rather than static monochromatic text (Piyasena et al., n.d.; Polo, 2023).

A crucial gap emerges when a static *pesantren* curriculum is applied to highly dynamic learners. Why is this problematic? Without pedagogical adaptation, Arabic reading competence will stall at the level of phonetic decoding without semantic depth or reading comprehension (Alzahrani & Almalki, 2025; Chan, 2024) How can a child accustomed to intuitive digital interfaces feel connected to classical texts without an innovative methodological bridge? This issue is not merely a technical teaching problem but a threat to the sustainability of Islamic knowledge transmission in the digital era.

Previous research on Arabic language learning in *pesantren* has generally focused on the effectiveness of traditional methods such as *Sorogan* (individual guidance) and *Bandongan* (collective learning) (Abdulghani & Dhiauddin, 2025; Fahraini & Sholichin, 2024; Hindun et al., 2024; Kaiki & Nuha, 2025; Kurniawan & Sudarno, 2025) or the integration of Mobile-Assisted Language Learning (MALL) in general (Alzieni, 2024; Figueiredo, 2023; Maghfurin et al., 2025) Some studies have also explored the use of visual media to enhance vocabulary (Gayathri & Vijayalakshmi, 2025; Saeed & Muhealddin, 2024; Syafaati & Syakban, 2025). However, most of this literature still views students as a homogeneous group, failing to distinguish the specific psychographic characteristics of Generation Z and Generation Alpha, who possess fundamentally different patterns of technological dependency (Bhanot & Gaikwad, 2025; Choudhary et al., 2024; Šramová & Pavelka, 2023).

This study fills the literature gap by shifting the analytical focus from mere technical instruments toward the development of an innovative pedagogical framework. Unlike previous research, which tends to be limited to testing applications or the effectiveness of a single method, this research offers a comprehensive strategy that blends the local wisdom of *pesantren* with contemporary learning theories for Generation Alpha. The significance of this study lies in its effort to address several critical voids in current literature: first, although various methods have been tested, there is still little research that deeply explores the learning experiences and subjective narratives of students within the *pesantren* ecosystem; second, there is a scarcity of literature capturing the transformation of Arabic learning as a dynamic narrative of pedagogical change; and third, there is a lack of studies examining how Generation Alpha students interpret *kitab kuning* (classical texts) amidst the strong influence of digital culture. Thus, this research examines not only the tools used but also how reading strategies are constructed and interpreted to align with the cognitive processing and identity of these digital-native generations.

Based on this background, this study aims to answer the following core problems: (1) How do the specific literacy characteristics of Generation Alpha affect the mastery of Arabic reading competence in a *pesantren* environment? (2) Considering the resources generally available in *pesantren*, what innovative pedagogical strategies can bridge classical Arabic texts with students' digital-native learning styles? (3) To what extent is this new framework effective in optimizing students' reading comprehension compared to conventional methods?

This research argues that the low level of Arabic reading competence among Generation Alpha in *pesantren* is caused not by the complexity of the language itself, but by the cognitive mismatch between static classical texts and the mindsets of students accustomed to non-linear, visual-interactive information processing. The primary hypothesis proposed is that Arabic literacy mastery can be optimized through a creative-hybrid pedagogy strategy. This approach does not rely on expensive high-tech infrastructure; rather, it maximizes available *pesantren* resources through three main pillars: visual contextualization to simplify abstract grammar rules, social collaboration to accommodate the communal nature of Generation Alpha, and the utilization of simple digital devices as media for accessing language corpora. By transforming the role of educators from deliverers of static material into learning facilitators, it is predicted that Generation Alpha students will demonstrate higher levels of engagement and retention compared to conventional, one-way rote learning methods.

METHODOLOGY

This study employs a qualitative design with a narrative case study approach to explore in-depth the learning experience narratives and Arabic teaching strategies for Generation Alpha within a *pesantren* environment (Cole, 2024; Creswell, 2009, 2013; Takona, 2024; Yin, 2018). The research site is Pesantren An-Nur 2 Al-Murtadlo, Indonesia, selected through purposive sampling as it represents a typological institution currently transforming its classical *kitab kuning* curriculum toward digital integration (Tajik et al., 2025) Key informants consist of six individuals: two *ustadz* (aged 30–45 years) experienced in methodological transitions, and four Generation Alpha students (aged 10–13 years) in the 1st and 2nd grades of the *Ula* level (the basic level in *pesantren*) as the primary subjects of cognitive transformation. The selection of these informants aims to capture a comprehensive spectrum of narratives, ranging from institutional policies to the emotional experiences of students within a school housing approximately 6,000 students, making it an ideal microcosm for observing technological adaptation in a significant population.

The interview procedures focused deeply on the six key informants, who were interviewed through semi-structured sessions lasting 45–60 minutes periodically to construct a chronology of their learning experiences, from the initial phase to the adaptation of new strategies. The researcher intentionally delved into narratives revealing personal meaning and participants' emotional fluctuations ranging from frustration when facing monochromatic texts to enthusiasm in game-based discovery to capture the essence of their inner transformation (Brandell & Varkas, 2001; Schlunegger et al., 2024). In this process, the researcher acts as a "restoryer" who weaves fragments of the informants' memories into a coherent narrative arc, ensuring that every obstacle and breakthrough in understanding classical texts is portrayed as a journey of humanized pedagogical transformation.

Data analysis follows the interactive model of Miles, Huberman, and Saldana (Miles et al., 2014) beginning with the condensation of narrative data, simplifying the complexity of field findings, presenting them in chronological descriptions, and finally drawing conclusions. Triangulation was conducted concretely by cross-referencing classroom observation notes with student interview transcripts to ensure consistency between practice and perception. To guarantee credibility, the researcher held periodic discussions with the students (*santri*) to ensure that the resulting pedagogical framework is truly rooted in the narrative reality of the field.

RESULTS

Literacy Characteristics of Generation Alpha in Arabic Language Learning

The literacy characteristics of Generation Alpha in the context of reading Arabic texts are operationally defined as a tendency for students to process texts through multimodal and non-linear approaches, where the comprehension of meaning is formed more rapidly through visual aids and digital contexts compared to pure text decoding methods. In the field, these characteristics manifest as a visual-intuitive cognitive schema the students' ability to recognize grammatical patterns not through rote formulaic memorization, but through the recognition of shapes and colors frequently encountered in digital interfaces. This indicates that their literacy is no longer monolithic (text-only) but is heavily dependent on how the text is presented aesthetically and interactively.

Regarding this, a student (Informant A, 12 years old, 2nd grade of *Ula*/CEFR Level A2) stated: *"I understand the meaning of the book faster if the teacher uses colorful scribbles on the whiteboard or if there are pictures. If I only read plain text without vowels (unvocalized texts/kitab gundul) in the book, it feels like all the letters are the same image and it's boring."* This statement suggests that for Generation Alpha, monochromatic classical Arabic texts create a sensory barrier. The researcher interprets that they require additional visual stimulation to distinguish word functions, as they are cognitively accustomed to user-friendly application interface designs. The perspective of another student (Informant E, 12 years old, 2nd grade of *Ula*/CEFR Level A2) reinforces the need for varied stimulation: *"If there is a short video about the story in that book (kitab), I become more excited to read the Arabic text."* This indicates multimodal engagement, where audio-visual narratives act as a motivational trigger before students perform deeper textual analysis. This represents the success of inquiry-based learning, which positions students as active subjects in constructing understanding.

Echoing this, a teacher (Informant B) explained: *"Children today find it very difficult to focus when asked to read the Matan Al-Jurumiyah through memorization. However, if we ask them to search for root words in a digital dictionary application in the lab, they are very enthusiastic and find the meaning very quickly."* These data indicate a shift from rote-based literacy toward exploratory literacy. The researcher views this dependence on digital devices not as a weakness, but as a new cognitive style where the speed of information access (instant access) becomes the primary key to building their reading competence. Another teacher (Informant D) explained that current students have a strong visual affinity: *"They prefer to distinguish between Isim (nouns) and Fi'il (verbs) through color codes rather than memorizing their characteristics verbally."* This phenomenon is a preference for visual encoding, where color schemes serve as cognitive anchors that accelerate the identification of word categories without the cognitive load of pure verbal memorization.

Classroom observations revealed that when students encounter complex Arabic texts, they instinctively perform hand gestures such as scrolling or zooming in on physical book pages, reflecting muscle memory from using tablets, laptops, or computers. When material is presented without visual aids or modern analogies, boredom levels increase within the first few minutes; however, when the teacher uses a projector or graphic schemes, student participation increases dramatically. The researcher interprets that Generation Alpha students' focus is highly dependent on stimulus variation; they lose interest in one-way lecture methods but are highly responsive to challenges based on independent data searching.

Overall, these data show that the literacy characteristics of Generation Alpha in *pesantren* are undergoing a transition from a reading-to-memorize pattern to a visualizing-to-understand pattern. The identified pattern is a visual search pattern, where students tend to perform a visual scan first before studying the grammatical structure of the text. This proves that their reading competence is

heavily influenced by the extent to which Arabic texts can be "visualized" and connected to their innate digital logic.

Table 1. Chronology of Pedagogical Transformation and Generation Alpha Literacy Findings

Journey Phase	Existential Conditions & Student Behavior	Cognitive Findings & Researcher Interpretation
I. Identification of Barriers (Pre-Intervention) (month 1)	Students experienced boredom with monochromatic texts (Informant A). Emergence of digital muscle memory phenomena, such as *scrolling* and *zooming* gestures on physical books.	Sensory Dissonance: A clash occurred between the students' dynamic cognitive architecture and static text media, causing a loss of focus within minutes.
II. Motivation Activation (Intervention Phase) (months 2-3)	Use of short videos as emotional bridges (Informant E). A shift from passive rote memorization to instant information hunting via digital dictionaries (Informant B).	Multimodal Engagement: Audio-visual narratives functioned as cognitive *triggers* that increased students' readiness for deeper textual analysis.
III. Crystallization of Understanding (Result Phase) (month 5)	Use of color-coding for word classification (*Isim/Fi'il*) as a replacement for verbal memorization (Informant D). Students performed visual scanning before reading the structure.	Visual-Intuitive Cognitive Schema: Colors and symbols served as cognitive anchors that lightened the verbal memory load, transforming the memorizing pattern into visualizing.

This pedagogical transformation begins with the identification of sensory barriers experienced by students when dealing with traditional methods. For Generation Alpha, such as Informant A (12 years old, CEFR Level A2), monochromatic classical Arabic texts without vocalization (*vowels*) are not merely difficult material, but a tedious visual expanse. Informant A recounts that without the stimulation of color or images, the text appears as a collection of uniform and boring symbols. This phenomenon is reinforced by classroom observations that captured unique moments: students instinctively performing hand gestures such as scrolling or zooming on the physical pages of their books. This muscle memory from digital device usage indicates that their cognitive architecture has been formatted to interact with dynamic interfaces; consequently, one-way lecture methods and static texts trigger boredom within minutes.

Entering the intervention phase, the narrative shifts to how external stimulation begins to awaken student engagement. Informant E (12 years old) revealed that the primary trigger for their enthusiasm lies not in the text itself, but in the audio-visual narrative that precedes it. The presence of short videos regarding the book's content serves as an emotional bridge that enhances their readiness for deeper textual analysis. At this point, the researcher observes success in positioning students as active subjects through inquiry-based learning. Teachers no longer merely present material to be memorized but provide exploratory challenges, as described by Informant B. When students are asked to search for root words via a digital dictionary application, the frustration of memorizing *Matan Al-Jurumiyah* is instantly replaced by competitive enthusiasm in the hunt for instant information.

In the final stage of the learning process, it was found that student understanding crystallized through the mechanism of visual-intuitive cognitive schemas. Informant D, a teacher, observed that the mastery of grammar (*Nahwu-Shorof*) occurs more effectively when students use color codes to distinguish word categories such as *Isim* (nouns) and *Fi'il* (verbs). The use of color serves as a cognitive anchor that releases them from the heavy burden of verbal memory. Overall, the chronology

of these findings indicates a fundamental shift: from a pattern of reading to memorize toward a pattern of visualizing to understand. The researcher concludes that the literacy competence of Generation Alpha in *pesantren* now depends heavily on visual search patterns; they perform rapid scans and graphic mapping before delving into the language structure, proving that classical texts will only remain relevant if they can adapt to the students' innate digital logic.

Innovative Pedagogical Strategies: Bridging Classical Texts and Digital Generation Learning Styles

In the context of this study, innovative pedagogical strategies are operationally defined as a hybrid instructional framework. This instructional framework adopts digital structural logic—such as algorithms, data visualization, and interactivity into traditional *kitab kuning* teaching methodologies. Rather than simply replacing books with screens, this strategy transforms static Arabic content into dynamic presentations through Visual Concept Mapping and inquiry-based text analysis aligned with the cognitive speed of Generation Alpha. In the field, this strategy manifests as instructional modules rich in symbols, colors, and hierarchical structures that resemble digital application interfaces.

The journey of this transformation began with a philosophical shift at the institutional policy level, pioneered by a senior *pesantren* figure. A senior teacher who is also the Head of the *Pesantren* (Informant C) emphasized the need to modernize material delivery without damaging its original substance through a sharp technological analogy: "We must change our perspective; *kitab kuning* is old software that requires a new interface so it can be read by today's children." The researcher interprets this vision as an effort to re-engineer the interface of tradition, where the essence of the classical text is preserved, but the way students interact with it is totally transformed to be more accommodative of Generation Alpha's digital logic.

Entering the implementation stage, this strategy materialized in the form of a hybrid instructional framework that adopts algorithmic logic into grammar. Informant C explained the concrete practice in the field: "We have started using the 'Nahwu Algorithm Scheme' method. Students no longer memorize definitions; instead, they learn to follow flowcharts if they find a certain word, the options are A or B. It turns out students understand it faster because they feel like they are operating a menu on their phones." The researcher views this phenomenon as a successful cognitive analogical mapping, where complex Arabic grammatical logic is remapped into the digital branching logic familiar to the students' daily lives.

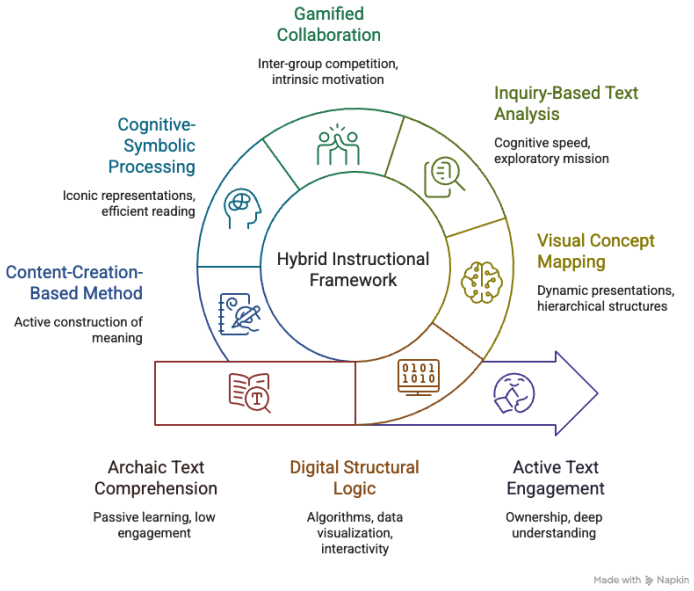

Figure 1. Hybrid instructional framework

Classroom dynamics then evolved into a supportive competitive space through a more fluid approach. A young teacher (Informant B) described how the rigid atmosphere of the *pesantren* began to thaw: "I use an inter-group competition method to analyze text; they compete as if they are playing a game." The researcher identifies this as a gamified collaboration pattern, where students' intrinsic motivation emerges when they feel they are on an exploratory mission. Support for visual symbolism is also key, as expressed by Informant A, who prefers iconic representations: "I like it better when the Teacher lets us use symbolic codes in the book, rather than just using *makna gandul* (brief translation notes written under the Arabic text) which are messy for writing notes. It makes it more fun and easier to read!" This marks the emergence of a cognitive-symbolic processing pattern that significantly increases reading efficiency.

In the final stage, this strategy successfully transformed the students' position from passive recipients into active constructors of meaning. Informant D (11 years old, CEFR Level A1) illustrated his enthusiasm for the content-creation-based method: "Learning Arabic and reading the *kitab* is so much fun now! Because, every time we finish reading a paragraph, we are asked to make cool drawings in our notebooks to explain the content. It feels like making content for social media, but this is the hand-drawn version on paper. So, it's not boring!" The researcher concludes that through this interactive logic pattern, psychological barriers toward ancient texts which were considered archaic are eroded and replaced by a sense of ownership over their learning outcomes. Ultimately, this engagement-based pedagogy proves that a deep understanding of classical Arabic texts can grow organically when the architecture of material delivery aligns with the exploratory instincts and cognitive architecture of the digital generation.

The Effectiveness of the Innovative Framework in Optimizing Reading Comprehension

The effectiveness of the new framework in this study manifests as a level of cognitive resonance, a condition where teaching methods align with the information processing speed of Generation Alpha. In the initial phase, researchers identified that students' mental barriers toward dense, unvocalized Arabic texts (*kitab gundul*) began to erode. Informant A (11 years old) recounted this shift in deeply personal terms: *"Back then, during kitab lessons, I just followed the Ustadz's reading like a duckling (manut); I just imitated whatever he said. But now I actually know—oh, so this is the reason why the vowel must be Dhommah, because there are color-coded lines that help me understand the flow."* Researchers interpret this as a transition from cognitive imitation toward independent inferential comprehension.

This pattern of understanding subsequently evolved into more precise grammatical accuracy within the classroom. Informant B (Lead Teacher) testified to the students' technical progress: *"Comprehension test scores have increased dramatically; the children are no longer confused between subjects and objects in long sentences."* This improvement is not merely academic success but a result of a delivery architecture that allows students to perform "debugging" or the deconstruction of sentence structures using logic similar to simple programming. Students are no longer trapped in the complexity of formulas; instead, they follow a logical visual navigation map.

Learning acceleration became the next crucial finding concerning time efficiency. Informant C (Senior Teacher) observed that this method significantly cut down the time required for basic text recognition: *"This method cut the introduction to basic texts from three months to just one month because the logic matches their understanding."* This acceleration occurred because the cognitive load which usually piles up at the start of learning due to the requirement of memorizing rules before understanding the text is now evenly distributed through visual aids and interactive logic that is more "friendly" to the digital-native brain.

The calmness and independence of students when facing new challenges serve as clear evidence of emerging literacy autonomy. When tested with a previously unstudied text, Informant D (12 years old) demonstrated an analytical capacity that no longer relied entirely on teacher guidance. In his characteristic style, he remarked: *" Saiki nek ketemu kalimat sing angel (Now, if I hit a difficult sentence), I don't get confused looking for the Ustadz right away. I scan the pattern first, then I sort it out using the color logic I was taught. Jebule (Turns out) it's easy; I can find the meaning myself without having to be spoon-fed."* This accelerated decoding pattern proves that students now possess the mental tools to solve Arabic text complexities independently.

This success also triggered the emergence of critical literacy, where students began questioning the information architecture behind the text. Informant B further explained that classroom interaction has become much more dynamic: *"The students are more critical now; they often ask 'why' the sentence structure is like that rather than just asking 'what' it means; this is a major breakthrough for us."* Researchers identify this as a "Deep Analysis Pattern," where Generation Alpha uses logic to validate the knowledge they receive an essential skill in the era of digital information saturation.

The effectiveness of this method turned out to transcend the classroom walls, reaching into the students' domestic spaces through retentive transfer. Informant E (11 years old) shared how he shares his knowledge at home: *"When I'm at home, I like to tell my Mom about the stories in the kitab I read. I explain it in my own language so she understands (mudeng). I'm so happy I can show off that I actually understand the content, not just that I've memorized the sound."* This phenomenon signifies a meaning-making synergy, where ancient classical Arabic linguistic structures can be translated into contemporary modes of communication relevant to daily life.

Support for this methodological optimization also came from the students' firsthand experience of the changed learning atmosphere. Informant F (12 years old) reflected on his experience: *"If only (umpamane) learning had been this fun from the start, maybe all (kabeh) my other friends would be experts at reading the kitab by now. Because this method doesn't give you a headache; instead, it makes you curious, like playing a text-puzzle game."* This expression reinforces the researcher's finding that successful strategies are those capable of transforming instructional pressure into a methodological attraction that challenges the students' exploratory instincts.

Table 2. Chronology of the Effectiveness of the Innovative Framework in Arabic Learning

Journey Phase	Cognitive & Behavioral Development	Effectiveness Indicators
Month 1-2: Initiation & Deconstruction of Barriers	Transition from passive imitation to inferential comprehension. Students begin to understand the logical reasons behind grammar rules through visual flow.	Inferential Comprehension: Reduction of mental barriers toward monochromatic texts.
Month 3-4: Acceleration & Technical Accuracy	Ability to perform "debugging" of sentence structures. Basic text recognition time cut from 3 months to 1 month due to evenly distributed cognitive load.	Grammatical Accuracy & Learning Acceleration: Up to a two-fold increase in absorption speed.
Month 5: Autonomy & Critical Literacy	Emergence of independent analytical capacity. Students use pattern-scanning techniques before reading and begin to ask "why" behind the text structure.	Literacy Autonomy: Ability to solve complex text structures without total dependence on the teacher.

Month 6: Crystallization & Retentive Transfer	Flexible mastery of concepts. Students are able to retell classical kitab content using contemporary language relevant to the home environment.	Meaning-Making Synergy: Transformation of rigid memorization into retentive conceptual mastery.

In concluding this series of findings, the researchers assert that the effectiveness of the innovative strategy lies in its ability to double the students' absorption rate through an accelerated symbolic decoding mechanism. This success is not the result of simplifying the material—which would reduce academic weight tbut rather the result of aligning the delivery architecture with the cognitive style of the digital generation. Reading comprehension eventually transforms from mere rigid text memorization into flexible conceptual mastery, providing students with a solid literacy foundation for their future.

DISCUSSION

The findings of this narrative case study reveal that the literacy characteristics of Generation Alpha in *pesantren* are marked by a strong multimodal preference, where Arabic texts are no longer processed linearly but through visual scanning mechanisms. This phenomenon confirms Prensky's theory regarding the evolution of the screen generation (Ay & Caner, 2025; Borchert, 2024), however, this study provides a specific contribution within the context of classical languages: this visual dependency is not merely a learning style, but a cognitive defense mechanism against the morphological complexity of Arabic (Ellis, 2016; Zwitserlood, 2018). While previous research often pitted rote traditions against digital effectiveness (Abdulghani & Dhiauddin, 2025; Fahraini & Sholichin, 2024; Hindun et al., 2024; Kaiki & Nuha, 2025; Kurniawan & Sudarno, 2025), the narratives from Informants A and D demonstrate that for Alpha students, the comprehension of classical texts relies heavily on the "aesthetics of information." This finding expands the horizon that while cognitive shifts are universal, the challenges are far more essential in languages with high morphological structures.

Table 3. Position of research contribution in academic discourse

Comparative Aspect	Previous Studies (Conventional/MALL)	Findings of This Study (Narrative Case Study)	Academic Contribution
Media	Focus on hardware or monochromatic physical books.	Focus on Interface Logic (colors, symbols, algorithms) on any media.	Redefinition of technology in classical language pedagogy.
Learning Process	Linear, rote-based, and Teacher-Centered.	Non-linear, inquiry-based, and Independent Meaning Construction.	Strengthening of constructivist theory in the *pesantren* ecosystem.
Cognitive Load	High, as rules must be memorized before the text is understood.	Low, as rules are visualized as Cognitive Anchors.	Validation of Sweller's Cognitive Load Theory on Arabic subjects.

The hybrid instructional framework strategy identified in this study proves to be an effective bridge between *pesantren* orthodoxy and contemporary learning styles. In contrast to literature on Mobile-Assisted Language Learning (MALL) which often emphasizes hardware dependency (Alzieni, 2024; Figueiredo, 2023; Maghfurin et al., 2025), this finding offers an antithesis:

pedagogical innovation actually lies in the adaptation of "digital interface logic" into conventional media. This provides strong empirical support for Sweller's Cognitive Load Theory (Chen et al., 2023; Sweller, 2023, 2024). The use of flowcharts and color codes by the teachers (Informants B and C) significantly reduced the intrinsic cognitive load of complex Arabic grammar. Here, the study's contribution challenges the assumption that digital technology must always be physical (devices); rather, technology can manifest as the systematization of logical thinking aligned with digital-native brain architecture.

The analysis of this framework's effectiveness, when contrasted with conventional methods, reveals a pattern of accelerated symbolic decoding. In traditional language education literature, comprehension is often viewed as a byproduct of repetition and memorization. However, the six-month chronological narrative of this research confirms that for Generation Alpha, comprehension is a result of active exploration. These findings resonate with Vygotsky's social constructivism principles (Daramola et al., 2024; Tasos, 2024), yet with a crucial modification regarding autonomy. While conventional methods position the teacher as the sole authority in the transfer of meaning, this new framework provides students with "clue keys" as independent mental tools to dissect text, thereby creating what researchers term as literacy autonomy for Alpha students.

Theoretically, this research contributes to redefining the concept of Arabic literacy for the digital generation. The study challenges the establishment of *Sorogan* and *Bandongan* methods, which are often perceived as static and final. By offering a Pedagogical Interface model, this research posits that the future sustainability of ancient languages depends not on the preservation of rigid methods, but on the methodology's ability to simulate the non-linear workings of the digital brain. The practical implication urges a reorientation of the teacher's role from a material deliverer to a designer of data visualization and gamification. This innovation is highly relevant for *pesantren* with limited resources as it emphasizes a paradigm shift over expensive infrastructure procurement, ensuring that classical Islamic intellectual traditions retain analytical sharpness in the digital era.

CONCLUSION

This narrative case study concludes that Arabic reading competence in Generation Alpha is determined by the cognitive resonance between the language's morphological structure and multimodal information processing preferences. The primary findings indicate that the transition from linear memorization methods to a hybrid instructional framework integrating flowcharts, color coding, and digital logic effectively reduces cognitive load and enhances students' independent meaning inference. The study's main theoretical contribution lies in the formulation of the Pedagogical Interface model, an analytical framework that positions teaching methodology as a technical mediator simulating digital navigation within traditional texts. This novelty transcends conventional *pesantren* education literature by proving that literacy barriers in the digital-native generation are not caused by decreased motivation, but by the dissonance between static media and the students' dynamic cognitive architecture.

Despite providing deep insights into classroom dynamics, this research is limited by its single geographic scope; thus, the generalization of findings across various *pesantren* typologies requires careful interpretation. The practical implication for educators and *pesantren* institutions is the importance of repositioning the teacher's role from a mere source of meaning transmission to a designer of interactive and visual learning environments. Curriculum revitalization should prioritize the adaptation of delivery logic over expensive hardware procurement to ensure that the intellectual tradition of *kitab kuning* remains accessible to future generations. Future research is suggested to evaluate the effectiveness of this framework across a broader spectrum of *pesantren*, both *salaf* and

modern models, and to explore the potential integration of Artificial Intelligence (AI) as an automated visual mapping tool to validate the decoding patterns formulated in this study.

DECLARATION OF AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

This manuscript was prepared using Google Gemini to assist in enhancing language quality and text readability. Napkin AI was used to generate necessary images to clarify the content. Following the use of these tools, the authors carefully reviewed and edited the content as needed and take full responsibility for the contents of this publication.

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AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation.
Author 2: Conceptualization; Data curation; Investigation.
Author 3: Data curation; Investigation; Writing - review & editing.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing financial interests or known personal relationships that could be perceived as influencing the work reported in this paper.

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