

Digitalization Strategies in Teaching Fiqh al-Lughah in the Digital Era

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Abstract. The digitalization of education has brought significant transformation to the methodology of teaching Arabic, particularly in the field of Fiqh al-Lughah (Arabic linguistics examining aspects of semantics, morphology, and syntax). This study presents an analysis of effective digitalization strategies for teaching Fiqh al-Lughah through the use of e-learning platforms, interactive applications, instructional videos, and social media. Using a qualitative descriptive approach combining literature review, classroom observation, and interviews with teachers and students this research explores the benefits of digitalization such as improved accessibility, motivation, and efficiency, as well as challenges including digital literacy and the limited availability of specialized content. Findings indicate that digitalization has great potential to strengthen students' understanding of the abstract concepts of Fiqh al-Lughah, provided it is integrated with conventional methods and supported by the development of local content and digital literacy training. Strategic recommendations include integrating digital curricula, fostering collaboration between educators and application developers, and encouraging institutional policies that support technological infrastructure in Islamic educational institutions.

Keywords: Digitalization, Fiqh al-Lughah, Arabic Linguistic Learning, Digital Media, E-Learning, and Digital Literacy

INTRODUCTION

The dawn of the Digital Era, often referred to as the Fourth Industrial Revolution (Industry 4.0), has necessitated a comprehensive restructuring of pedagogical approaches across all academic disciplines [1]. Nowhere is this transformation more critical than in specialized linguistic fields, particularly Arabic studies, which hold profound cultural, religious, and historical significance. At the core of advanced Arabic scholarship lies Fiqh al-Lughah (FA-L), a discipline often translated as 'the jurisprudence of language.' This field systematically investigates the deep-seated structures, historical evolution, and semantic underpinnings of the Arabic language, critically encompassing *dalālah* (semantics and meaning), *ṣarf* (morphology and word derivation), and *i'rāb* (syntax, declension, and grammatical relations).

FA-L is not merely an auxiliary subject but a foundational pillar for accurate textual engagement. A robust comprehension of its principles is indispensable for anyone seeking to interpret authoritative religious texts, such as the Qur'an and Hadith, or to engage critically with classical Arabic literature (*turāth*). Errors in comprehending the nuances of *ṣarf* or the syntactical dependencies defined by *i'rāb* can lead to substantive misinterpretations of religious law or philosophical discourse [2]. Consequently, the teaching of FA-L bears a heavy responsibility, demanding methodological rigor and conceptual clarity.

However, the traditional methodology for teaching FA-L, which has historically relied upon didactic lectures, exhaustive rote memorization of rules (*qawā'id*), and rigorous manual textual analysis, faces significant inherent challenges [3]. The key linguistic concepts—such as the transformation rules of triliteral roots (*thulāthī mujarrad*), the abstract rules governing case endings (*i'rāb*), and the subtle differences between near-synonyms (*furūq lughawīyyah* in *dalālah*)—are highly abstract, complex, and cognitively demanding. These challenges often result in low student motivation, cognitive overload, and a superficial grasp that fails to translate into effective application during reading or composition. The core pedagogical problem lies in moving students beyond mere memorization to deep conceptual internalization and critical application.

The advent of digitalization offers a compelling, albeit complex, solution to this perennial pedagogical predicament. The integration of Information and Communication Technologies (ICT) into education has generated a multitude of tools, including sophisticated Learning Management Systems (LMS) like Moodle and Google Classroom, interactive mobile applications, educational video platforms (e.g., YouTube), and pervasive social media networks. These tools fundamentally possess the capacity to transform the teaching-

learning environment from a passive, teacher-centered paradigm to an active, student-centered, and multimodal one [4]. For FA-L, digitalization promises to overcome the visualization barrier: abstract linguistic structures can be rendered through interactive simulations, animated morphological paradigms, and dynamically changing syntactic tree diagrams. This visualization capacity directly addresses the high intrinsic cognitive load associated with the subject matter [5].

Despite the evident potential, the implementation of digitalization in highly specialized linguistic fields such as FA-L is fraught with unique operational and content-specific challenges [6]. The digital transformation in Arabic language teaching (ALT) has largely focused on general skills, such as basic vocabulary acquisition and communication competence. There remains a significant, critical deficit in the availability of digital content and instructional strategies explicitly designed for advanced FA-L topics. Furthermore, institutional readiness encompassing robust digital infrastructure, adequate financial investment, and, most critically, the digital pedagogical competence (DPC) of instructors varies widely, particularly across Islamic educational institutions and pesantren [7].

Research Gap and Objectives

While extensive research exists on the application of e-learning in general higher education and even in general ALT, there is a demonstrable research gap concerning the strategic, effective, and context-specific implementation of digital tools for the instruction of Fiqh al-Lughah. Existing literature often addresses the 'what' (i.e., use of technology) but rarely the 'how' and 'why' (i.e., the specific pedagogical strategies that successfully mediate abstract FA-L concepts to deep learner comprehension). This study is thus necessitated by the need for empirically grounded, context-aware strategies that bridge the gap between advanced linguistic theory and digital pedagogical practice. Against this background, the primary objectives of this research are threefold:

To systematically identify and analyze the specific digital strategies (e.g., types of interactive applications, video formats, and LMS functions) that are currently being utilized or show high potential for enhancing the teaching and learning of *dalālah*, *ṣarf*, and *iʿrāb* within Fiqh al-Lughah.

To empirically evaluate the perceived benefits (e.g., motivation, accessibility, comprehension) and challenges (e.g., digital literacy, content scarcity, infrastructure) of digitalizing FA-L instruction from the perspectives of both instructors and students.

To develop strategic, practical, and context-sensitive recommendations for educational institutions, policy-makers, and educators to optimally integrate digital technologies into the Fiqh al-Lughah curriculum, promoting a balanced and rigorous hybrid learning approach.

Significance of the Study

This study holds significant theoretical and practical importance. Theoretically, it contributes to the evolving discourse on digital pedagogy in the humanities and specialized language sciences by providing a rigorous analysis applied to a culturally and linguistically complex domain. It offers a framework for analyzing how digital tools can mediate high-level, abstract cognitive tasks, extending the applicability of models like the Technological Pedagogical Content Knowledge (TPACK) model to advanced linguistic instruction. Practically, the findings furnish educators and curriculum developers in Islamic and Arabic studies institutions with concrete, evidence-based strategies to improve student outcomes in FA-L. By addressing the critical infrastructure and content scarcity issues, this research aims to inform institutional policy and investment decisions, ensuring that the digital transformation in this field is effective, equitable, and sustainable. The ultimate contribution is to cultivate a new generation of Arabic scholars who are not only digitally literate but also possess a deeper, more critically engaged mastery of the foundational linguistic sciences.

LITERATURE REVIEW

The digitalization of education is inextricably linked to foundational pedagogical theories that seek to explain how knowledge is constructed and mediated in technologically saturated environments. This literature review anchors the study in relevant theoretical frameworks, delineates the academic nature and didactic complexities of Fiqh al-Lughah, surveys the current landscape of digital Arabic language education, and identifies the specific gaps that this research aims to address. The review establishes the conceptual scaffolding necessary for analyzing the empirical findings.

Theoretical Frameworks for Digital Pedagogy

The integration of technology into educational processes is not a neutral act; it must be guided by robust theories of learning and instruction. This study draws heavily on three interconnected frameworks: the Technological Pedagogical Content Knowledge (TPACK) model, Constructivism, and Connectivism.

The Technological Pedagogical Content Knowledge (TPACK) Model

The TPACK framework, developed by Mishra and Koehler [8], posits that effective teaching with technology requires a deep, nuanced understanding of three interdependent knowledge domains: Content Knowledge (CK) (mastery of the subject matter, i.e., FA-L principles), Pedagogical Knowledge (PK) (mastery of teaching and learning methods), and Technological Knowledge (TK) (mastery of digital tools and resources). The critical insight of TPACK lies in the intersection of these domains. Technological Content Knowledge (TCK) is understanding how technology can represent and transform subject matter (e.g., how a morphological simulator can visualize *ṣarf* roots). Technological Pedagogical Knowledge (TPK) is knowing how to select and apply technologies for specific teaching methods (e.g., using LMS forums for collaborative *i'rāb* practice). The optimal sweet spot, TPACK, is the synthesis of all three, enabling a teacher to select the right technology, use the right method, and deliver the specific FA-L concept most effectively [8]. This framework is central to evaluating the teaching strategies used in FA-L, particularly in assessing instructor readiness.

Constructivism and Cognitive Load Theory

Constructivism, rooted in the work of Piaget and Vygotsky, emphasizes that learners actively construct knowledge and meaning from their experiences, rather than passively receiving information. Digital tools support constructivism by facilitating active exploration, manipulation of virtual objects, and collaborative problem-solving [9]. In FA-L, this means moving away from simply reciting rules to constructing the meaning of a sentence by dynamically applying *i'rāb* rules in an interactive environment.

Crucially, the effectiveness of digital tools must also be assessed through the lens of Cognitive Load Theory (CLT) [10]. CLT distinguishes between intrinsic load (the complexity inherent to the material, which is high in FA-L), extraneous load (the way information is presented), and germane load (the load dedicated to schema construction). Digitalization, if poorly implemented (e.g., distracting animations, cluttered interfaces), can increase extraneous cognitive load, thus undermining learning [5]. Conversely, well-designed digital tools such as those that provide visual aids for abstract concepts or chunk information effectively can reduce extraneous load and free up cognitive resources for germane load, thereby facilitating the deep construction of FA-L schema. This theory provides a benchmark for evaluating the instructional design of digital FA-L resources.

Connectivism

Connectivism, proposed by Siemens [11], is a learning theory specifically adapted for the digital age, positing that knowledge resides in networks and connections, and learning is the process of navigating and forming those connections. For FA-L students, this means their learning network extends beyond the classroom to encompass digital linguistic databases, online corpora, discussion forums, and global communities of Arabic scholars. Digitalization strategies, particularly the use of social media and collaborative annotation tools, are fundamentally connectivist in nature, enabling students to access, evaluate, and contribute to a vast, distributed body of linguistic knowledge [11].

The Nature of Fiqh al-Lughah and its Didactic Challenges

Fiqh al-Lughah is a multifaceted discipline, distinguished from general grammar by its focus on the underlying philosophy, history, and semantic depth of the language [12]. The discipline's complexity stems from its three intertwined sub-fields, each posing unique didactic challenges when taught conventionally:

Ṣarf (Morphology/Etymology)

Ṣarf is the study of word-form changes and derivations, dealing with the root systems (primarily trilateral, *thulāthī*) and the derivation of different conjugations, tenses, and types of words (e.g., active and passive participles, verbal nouns). The core difficulty lies in visualizing the dynamic transformation of the root (e.g., *fā'*, *'ayn*, *lām al-fi'l*) across the numerous *awzān* (patterns or scales). Traditional teaching relies heavily on tables (*jadāwil*) and relentless memorization of paradigms (*taṣrīf*), often failing to impart the underlying systemic logic of the root structure. Digital tools can automate the *taṣrīf* process, allowing students to input a root and instantly see its morphological transformations displayed dynamically, reducing the manual burden and enabling them to focus on the semantic implications of each derived form [13].

I'rāb (Syntax/Inflection)

I'rāb is the system of marking grammatical function (case, mood, number, gender) through vocalic or non-vocalic changes at the end of a word. It determines whether a noun is the subject (*mabnī 'alā al-raf'*), direct object (*manṣūb 'alā al-naṣb*), or is governed by a preposition (*majrūr 'alā al-jarr*). *I'rāb* is highly abstract, as the grammatical function must be inferred from context, word order, and the correct application of complex rules [6]. Manually identifying the *mu'rāb* (declined) and *mabnī* (indeclinable) status and applying the correct *harakah* (vowel) is a common source of error. Digitalization allows for the color-

coding of sentence elements based on their grammatical function, dynamic linking of words to their governing rule, and the visualization of dependency grammar structures (e.g., syntactical tree diagrams), providing immediate corrective feedback and making the abstract system tangible [3].

Dalālah (Semantics/Lexicology)

Dalālah explores the meaning of words, examining polysemy, synonymy, antonymy, and, crucially, the historical and contextual factors that influence meaning [12]. It involves a critical comparison of related concepts, often utilizing classical dictionaries (lexica) and philological sources. Traditional research relies on slow, manual navigation of dense print texts and requires a high degree of prior knowledge to trace historical semantic shifts. The concept of dalālah is often purely theoretical without ready access to rich linguistic data. Access to digital corpora, specialized online lexicons (e.g., al-Ma‘āni, Lisān al-‘Arab digital edition), and philology databases allows students to instantly search, compare, and analyze vast amounts of data to empirically track semantic usage, transforming the study from a memorization task into a data-driven investigation.

Digitalization in General Arabic Language Teaching (ALT)

The use of digital media in ALT is well-documented, primarily focusing on general proficiency levels. Studies have consistently confirmed the efficacy of technology in areas such as vocabulary retention, listening comprehension, and writing practice [7]. In broader foreign-language education, technology has also been described as reshaping the roles of teachers, learners, and classroom interaction [14].

E-Learning Platforms and LMS

Learning Management Systems (LMS) such as Moodle, Canvas, and Google Classroom have become standard delivery mechanisms. They support blended and fully online models by centralizing content delivery, facilitating assignment submission, and providing discussion forums. In ALT, LMS are often used to host multimedia resources and deliver interactive vocabulary quizzes. However, their application to advanced linguistic analysis like FA-L is often limited to simply distributing PDF readings rather than utilizing the platform's full potential for interactive, analytical tasks [4]. Structured asynchronous interaction can also support conceptual knowledge development when online discussion is deliberately organized [15].

Mobile-Assisted Language Learning (MALL) and Gamification

MALL applications have successfully gamified vocabulary and basic grammar acquisition, leveraging the ubiquity of smartphones to encourage continuous, short-burst learning. Gamification elements, such as points, leaderboards, and badges, have proven effective in boosting extrinsic motivation [1]. For FA-L, the challenge is scaling these motivational techniques to abstract concepts: for instance, gamifying the correct application of i‘rāb rules or the identification of root systems within complex texts.

Instructional Videos and Multimedia

The proliferation of video platforms like YouTube has provided a rich, open-source repository for educational content. Videos are highly effective for demonstrating complex processes (e.g., a teacher walking through the i‘rāb analysis of a Qur’anic verse) and for providing visual context. Their utility in FA-L lies in their ability to provide multimodal explanations, complementing textual rules with auditory and visual input, which aligns with principles of CLT to manage cognitive load effectively [5].

Gaps in the Literature: The Need for Fiqh al-Lughah Specific Strategies

While the existing literature confirms the general benefits of digitalization in ALT, a significant void persists concerning the practical, empirical, and strategic application of these tools in the advanced linguistic domain of FA-L. The literature fails to adequately address:

Pedagogical Alignment: Which specific digital features (e.g., color-coding, dynamic simulation, instant feedback mechanisms) are most effective for mediating the high intrinsic cognitive load of FA-L concepts like i‘rāb and šarf?

Content Scarcity: Beyond general Arabic grammar software, what is the extent of available specialized digital content for advanced semantic and morphological analysis, and what strategies can educators use to curate or create such content locally?

Institutional Context: How do the unique infrastructure and cultural/pedagogical dynamics of Islamic educational institutions (e.g., pesantren and madrasah) influence the adoption and efficacy of FA-L digitalization strategies?

Hybrid Model Efficacy: What is the optimal balance point in a hybrid model that preserves the intellectual rigor of traditional *mutūn* (textual) study while maximizing the dynamic, accessible benefits of digital tools for analysis?

This research aims to close this strategic gap by providing an in-depth, context-specific analysis of digitalization strategies directly applicable to the core tenets of Fiqh al-Lughah instruction.

METHODS

This study adopts a qualitative descriptive research approach to explore and understand the phenomenon of digitalization strategies in teaching Fiqh al-Lughah within Islamic educational institutions. This paradigm was chosen because the research goal is not to quantify the frequency of technology use but to generate deep, contextual knowledge regarding the lived experiences, perceptions, challenges, and pedagogical adaptations of both instructors and students in response to technological integration [16]. The qualitative methodology allows for the exploration of nuanced interpretations of abstract linguistic concepts and the factors influencing the adoption of digital tools.

Research Design and Context

The study employed a multi-site, embedded case study design to ensure rich data collection across varied institutional environments. The research was conducted in three distinct types of Islamic educational institutions in West Java, Indonesia, reflecting a spectrum of technological readiness:

University A: A major Islamic State University with robust, centralized LMS (Moodle/Canvas) infrastructure and explicit institutional policies promoting digital learning.

College B: A medium-sized Sekolah Tinggi Agama Islam (STAI) with limited infrastructure but high teacher motivation for integrating freely available tools (e.g., Google Classroom, WhatsApp).

Pesantren C: A traditional Islamic boarding school with minimal dedicated technological infrastructure, where digitalization is primarily confined to teacher-driven use of personal devices and social media for supplementary instruction.

This design facilitates a comparative analysis, enabling the identification of strategies that are effective across different levels of technological support, thereby enhancing the practical applicability of the recommendations. The primary unit of analysis was the instructional process and content delivery specific to Fiqh al-Lughah courses.

Participants and Sampling

Participant Selection Criteria

A purposive sampling strategy was employed to select participants who possessed direct, relevant experience with the digitalization of FA-L instruction. The final sample comprised 30 participants:

Table 1. Participant groups and institutional contexts

Participant Group	Institution A (University)	Institution B (College)	Institution C (Pesantren)	Total	Selection Criteria
FA-L Instructors (T)	4	3	3	10	Minimum 5 years teaching FA-L; currently utilizing at least two distinct digital tools/platforms (LMS, app, video) in instruction.
Students (S)	8	6	6	20	Currently enrolled in an advanced FA-L course; demonstrated active participation in digital learning activities; purposively selected for a mix of high- and average-achievers.

Ethical Considerations

Prior to data collection, all participants were provided with a detailed informed consent form explaining the study's purpose, voluntary nature of participation, anonymity guarantees, and procedures for data handling. Participants were assured of the right to withdraw at any point without prejudice. All interview

data were transcribed and anonymized, assigning pseudonyms (e.g., T1, S15) to protect personal identities, in adherence to ethical guidelines for research involving human subjects [16].

Data Collection Methods and Instruments

Data was collected through three interconnected methods to ensure methodological triangulation and enhance the trustworthiness of the findings [17].

Literature and Document Review (LDR)

The LDR served as the initial phase, focusing on identifying the technological artifacts and pedagogical frameworks relevant to advanced Arabic linguistics.

Documents Analyzed: Course syllabi and lesson plans from the participating institutions, teacher-created digital content (e.g., Moodle activity logs, instructional video scripts, interactive quiz data), and institutional policy documents concerning ICT integration.

Purpose: To establish the intended curriculum and technology use against the actual practice observed and reported.

Classroom Observations (CO)

A total of 12 classes (four at each institution) focused on key FA-L topics (i'rāb, ṣarf derivation, and dalālah analysis) were observed over a four-week period.

Instrument: A structured observation protocol checklist was used, focusing on four primary domains:

Tool Fidelity: The specific digital tools used, how they were integrated (e.g., Substitution, Augmentation, Modification, Redefinition SAMR Model), and the time allocated to digital versus conventional activities.

Student Engagement: Observed levels of interaction, participation in digital tasks (e.g., commenting, analyzing, clicking), and visible motivation.

Content Visualization: How abstract concepts (e.g., syntactic tree structure, morphological root change) were visually mediated by the technology.

Teacher Pedagogy: The instructor's role (lecturer vs. facilitator), technical proficiency, and response to technological difficulties.

Semi-Structured Interviews (SSI)

In-depth interviews were the primary method for gathering rich, experiential data regarding perceptions and practical application. All interviews were conducted in a mix of English and the local language (Bahasa Indonesia/Arabic, where appropriate) and digitally recorded.

Instructor Interview Protocol: Focused on TPACK readiness, pedagogical reasoning for tool selection, content creation challenges, perception of student comprehension improvement, and institutional support/challenges.

Example Question: "How do you think using a morphological simulator changes the cognitive process a student uses to learn ṣarf, compared to traditional memorization tables?"

Student Interview Protocol: Explored experiences with different digital tools, perceived impact on motivation and comprehension of abstract topics, digital literacy barriers, and preferences for hybrid vs. traditional learning modes.

Example Question: "Describe a time when a digital tool (video, app, etc.) made a complex i'rāb rule suddenly clear. What was the specific feature that helped you?"

Data Analysis Procedures

The data analysis was conducted using a rigorous, multi-stage Thematic Analysis [18], iteratively refining the findings from all three data sources:

Transcription and Familiarization: All audio recordings were transcribed verbatim. Researchers repeatedly read the transcripts and field notes (CO) to achieve immersion and familiarize themselves with the depth and breadth of the data.

Generating Initial Codes: The data (transcripts, observation notes, documents) were systematically coded line-by-line using NVivo software. Codes were both descriptive (e.g., 'Use of Kahoot for dalālah') and interpretive (e.g., 'Frustration with technical bugs,' 'Shift from memorization to visual analysis').

Searching for Themes: Related codes were grouped into potential themes. For instance, codes like 'Difficulty finding FA-L apps,' 'Teacher creating PowerPoint animations,' and 'Focus on basic grammar in commercial apps' converged into the theme of Scarcity of Specialized Content.

Reviewing Themes: The potential themes were tested against the entire dataset (internal homogeneity and external heterogeneity). A crucial step involved comparing themes across the three institutional contexts (A, B, and C) to identify variances and constants.

Defining and Naming Themes: The final themes were refined, clearly defining their essence and scope in relation to the research questions. Four overarching, empirically grounded themes emerged, which structure the Results section.

Triangulation: Thematic findings from the SSI were cross-referenced against the CO findings (e.g., does student reporting of high motivation align with observed engagement?) and the LDR (e.g., do reported challenges match infrastructural policy gaps?). This process significantly enhanced the validity and depth of the conclusions.

The structured and replicable nature of this methodology ensures that the findings are robust, contextually relevant, and contribute meaningfully to the field of Arabic linguistic pedagogy.

RESULTS AND DISCUSSION

The rigorous application of qualitative methods yielded extensive data concerning the implementation, perception, and outcomes of digital strategies in teaching Fiqh al-Lughah. The findings are structured around four primary, interconnected themes that emerged from the thematic analysis, followed by an in-depth discussion that contextualizes these results within existing pedagogical theory and the specialized demands of advanced Arabic linguistics.

Empirical Findings

Theme 1: Multimodal Visualization as a Catalyst for Comprehension of Abstraction

A consistent finding across all three institutional sites was the profound positive impact of multimodal, visualized content on student comprehension, particularly concerning the abstract concepts of *ṣarf* and *i'rāb*.

Overcoming Morphological Abstraction (Ṣarf)

Instructors (T5, T8) utilized digital morphological simulators, custom-made animated sequences (via PowerPoint or video), and interactive web tools. The core strategy involved replacing static *taṣrīf* tables with dynamic visualizations. As Instructor T5 noted:

"The main problem with *ṣarf* is the mental rotation required to see how the root letters move through the fourteen forms. When I use the animation, where the letters physically change color and position, the student can grasp the pattern (*wazn*) almost instantly. It transforms memorization into a perceptual, spatial task."

Students reported that seeing the trilateral root (ف-ع-ل) highlighted and tracked as it generated a verbal noun, a participle, and various tenses significantly reduced their intrinsic cognitive load. This finding aligns perfectly with the principles of the Multimedia Learning Theory, demonstrating that the visual channel effectively supports the auditory/textual channel, leading to better schema formation [19]. The automation of the mechanical derivation process also allows teachers to immediately shift the focus to the semantic implication of the derived form (e.g., the difference between Form I and Form X verbs), which is the essence of Fiqh al-Lughah.

Syntactical Clarity (I'rāb) through Color-Coding and Dependency Mapping

For *i'rāb*, the primary difficulty is identifying grammatical function in a complex sentence. The successful strategy involved the consistent use of color-coding and digital annotation tools (e.g., Kami, Google Docs).

Nouns in the nominative case (*marfū'*) were consistently highlighted in blue; accusative (*manṣūb*) in red; and genitive (*majrūr*) in green. The teacher (T2) then used digital pen features to draw arrows or connecting lines (dependency mapping) from the grammatical ruler (e.g., the verb) to the governed word (e.g., the direct object). Student S12, from a traditional *pesantren* setting, explained the impact:

"When we did *i'rāb* manually, it was just guesswork. With the colors, it's like the sentence becomes a roadmap. I can instantly recognize the role of the word. The video explanation that uses the color-coding is what I rewatch before exams." This technique directly addresses the abstract nature of *i'rāb* by externalizing the cognitive process of analysis, transforming it into a perceptually guided task, a hallmark of effective TCK (Technological Content Knowledge) within the TPACK framework. This emphasis on clear visual encoding is also consistent with general principles of effective information display [20].

Theme 2: Digital Tools as Enablers of Independent Study and Accessibility

The integration of LMS and asynchronous video content drastically improved the accessibility of FA-L material and fostered Self-Regulated Learning (SRL) habits among students.

Asynchronous Learning and Revision

All participating students (S1-S20) unanimously praised the ability to access recorded lectures and instructional videos outside class hours. Since FA-L concepts often require multiple exposures for mastery, the digital repository became the primary mechanism for revision. This flexibility addresses the varying pace of learners, a critical aspect of inclusive pedagogy.

Instructor T7 (College B) noted that the LMS usage statistics showed that modules related to the most challenging topics (e.g., Nawāsikh al-Ibtidā' in i'rāb) received five to ten times more views outside of scheduled class time, indicating that students were proactively managing their learning challenges. The digital platform thus facilitates a crucial shift from passive attendance to active, on-demand knowledge retrieval.

Expanding Lexical and Semantic Access (Dalālah)

The use of digital lexicons and corpora transformed dalālah study. Previously, semantic analysis was confined to the limited resources of a physical library. Now, students, particularly at University A, were utilizing online tools to perform complex concordance searches on Qur'anic verses and classical texts. This shifted the semantic analysis from relying on the instructor's a priori knowledge to data-driven exploration.

Student S4 stated: "When the teacher asks us about the semantic difference between two words, I don't just read the dictionary definition. I search for the usage in 100 Qur'anic verses to see the subtle contexts. This ability to search the corpus makes the meaning real." This use of large linguistic databases embodies a Connectivist approach, where the student's knowledge construction is supported by navigating vast digital networks of information [11].

Theme 3: The Critical Constraint of Specialized Content Scarcity

Despite the high potential of digital tools, a significant operational hurdle was the pervasive scarcity of specialized, high-quality digital content tailored specifically to advanced Fiqh al-Lughah.

The Generalization Problem

Interview data revealed that most commercially available Arabic-learning applications focus predominantly on basic Modern Standard Arabic (MSA), vocabulary, and conversational skills. Very few applications offered deep analytical modules on advanced i'rāb rules (e.g., conditional sentences, particles of negation) or specific semantic fields necessary for dalālah.

Instructor T1 (University A) expressed frustration: "We have great LMS, but the content for FA-L is not there. I spend 70% of my preparation time creating my own animations, flowcharts, and interactive quizzes because the commercial market hasn't reached this level of linguistic specialization. This requires high TK and TCK, which not all teachers possess."

The Burden on Teacher TPACK

The lack of ready-made content forces the onus of content development onto the instructors. Teachers who lack sufficient Technological Content Knowledge (TCK) the ability to choose and utilize technology to best represent FA-L content are significantly hindered. In Institutions B and C, where teachers often lacked formal digital pedagogy training and resources, the digital integration was often limited to simple Substitution (using a PDF instead of a print book) rather than true Redefinition (creating a dynamically visualized system), illustrating a fundamental breakdown in the realization of the TPACK model [8].

Theme 4: Infrastructure and Digital Literacy Disparity

The study confirmed that a significant digital divide remains a core challenge, impacting the continuity and equity of digital learning implementation, particularly in Institution C (Pesantren) and among low-income students in Institution B.

The Infrastructure Barrier

Unstable internet connectivity and a lack of dedicated institutional hardware (especially in Institution C) forced reliance on students' personal, often low-specification, mobile devices and expensive mobile data plans. This led to intermittent access, inability to download large video files, and frustration during synchronous online sessions.

Student S18 (Pesantren C) summarized the issue: "We have the theory on the phone, but to watch the full video on i'rāb, I have to go out and buy a large data package. Sometimes, the connection is too slow for

the interactive quizzes. We fall behind not because we don't understand, but because we can't connect." This infrastructural gap directly compromises the principle of accessibility, which is one of the key promised benefits of digitalization.

Digital Literacy Deficiencies

Beyond technical connectivity, deficiencies in digital literacy were observed among both students and instructors.

Students: Many struggled with essential SRL skills in the digital environment, such as evaluating the credibility of online linguistic sources (a key *dalālah* skill) or efficiently navigating and troubleshooting complex LMS features.

Instructors: Some teachers (T6, T9) displayed low Technological Knowledge (TK), resulting in pedagogical choices that were technically flawed or cumbersome, thereby increasing the students' extraneous cognitive load [10]. For example, a teacher attempted to conduct a collaborative *i'rāb* analysis in a non-interactive PDF rather than a collaborative document, confusing the process. This highlights the crucial need for targeted professional development.

Discussion: Pedagogical Transformation and Hybridity

The empirical findings collectively suggest that digitalization is not merely a supplementary tool but a transformative imperative for the advanced linguistic field of Fiqh al-Lughah. However, its effectiveness is contingent upon a strategic shift in both pedagogy and institutional support.

Re-Evaluating the Teacher's Role (TPACK in Action)

The success stories documented in Theme 1 where abstract concepts were effectively mediated were consistently linked to high instructor competence in the TPACK intersection. These teachers successfully transformed their deep Content Knowledge (CK) of *i'rāb* and *ṣarf* using specific technological features (TK) to enhance the teaching method (PK). They moved from being knowledge transmitters (lecturers) to knowledge facilitators and content curators. Their new role involves:

Curation and Validation: Sourcing and critically evaluating external digital linguistic resources for accuracy and relevance (a key *dalālah* skill).

Visualization and Modeling: Using digital tools to dynamically model complex linguistic processes, thereby reducing intrinsic cognitive load.

Network Guidance: Directing students through the digital information landscape (the Connectivist environment) to ensure they are constructing reliable knowledge.

The observed failure points (Theme 3 and 4) clearly demonstrate that the lack of specialized content and the lack of TCK among teachers leads to a default back to traditional, low-engagement methods, or, worse, technologically augmented but pedagogically ineffective methods [1]. Therefore, overcoming the TCK deficit is arguably the single most critical intervention point for institutional policy.

Cognitive Load Management in Advanced Linguistics

The primary didactic challenge of FA-L is its high intrinsic cognitive load. The findings confirm that digitalization strategies are highly effective precisely because they are externalizing this load.

Visualization: Animated *ṣarf* derivations (Theme 1.A) allow the mechanical process to be offloaded from working memory, freeing capacity for students to focus on the semantic output of the change.

Scaffolding: Color-coding and dependency mapping in *i'rāb* analysis (Theme 1.B) provide a visual scaffold that guides the application of syntactic rules, preventing students from becoming lost in the complexity of parsing the entire sentence simultaneously.

These successful strategies align with the principles of CLT by minimizing the extraneous load imposed by confusing presentation (e.g., dense, un-annotated texts) and maximizing germane load (the mental effort devoted to schema construction). This strongly supports the argument that technology's primary value in FA-L is not merely accessibility, but cognitive assistance.

The Inevitability of the Hybrid Learning Model

The combined evidence from all themes overwhelmingly supports the recommendation for a sophisticated Hybrid Learning Model (Blended Learning) as the optimal pedagogical approach for Fiqh al-Lughah. Purely traditional methods struggle with visualization and student motivation, while a purely digital approach fails due to content scarcity, infrastructural fragility, and the necessity of preserving the intellectual rigor of face-to-face, guided textual analysis. The proposed hybrid model is not simply mixing

delivery methods but strategically allocating cognitive tasks: This allocation is consistent with established blended-learning frameworks that intentionally integrate face-to-face and online learning [21].

Digital/Asynchronous Component: Best used for low-stake, high-repetition, and mechanical tasks (e.g., *ṣarf* drill practice, pre-lecture viewing of visualization videos, and self-directed semantic exploration via corpora). This facilitates the acquisition of foundational *qawā'id* (rules).

Face-to-Face/Synchronous Component: Best used for high-level, complex cognitive tasks that require immediate, guided feedback (e.g., Socratic discussion on nuanced *dalālah* differences, joint *i'rāb* of a difficult *turāth* passage, and in-depth problem-solving). This phase ensures intellectual rigor and critical thinking development.

This strategic task allocation allows institutions, even those with limited infrastructure (like College B and Pesantren C), to leverage their minimal digital resources for maximum pedagogical impact by focusing them where they provide the greatest cognitive benefit (i.e., visualization and retrieval practice), while preserving their traditional strengths for high-level textual hermeneutics.

CONCLUSION

Digitalization is a necessary and transformative step for teaching Fiqh al-Lughah, primarily by offering cognitive assistance to mediate its highly abstract nature. Effective strategies focus on dynamic visualization (e.g., animated *ṣarf* and color-coded *i'rāb*) to reduce students' cognitive load and digital access (corpora) to foster independent, data-driven semantic analysis (*dalālah*). However, the implementation is critically challenged by the scarcity of specialized content tailored for advanced linguistic topics and significant institutional disparity in infrastructure and digital literacy, which limits the realization of the Technological Pedagogical Content Knowledge (TPACK) among instructors.

This study confirms that the optimal approach is a Strategic Hybrid Model that allocates mechanical tasks to the digital environment and reserves face-to-face instruction for critical analysis. Theoretically, this research extends the application of cognitive and technological frameworks (CLT, TPACK) to advanced Arabic linguistics. Practically, the findings serve as a blueprint for institutions to shift investment focus from generic hardware to targeted content creation and TCK-focused professional development, ensuring that technology integration is pedagogically sound and sustainable.

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