

Developing Arabic-Language Curricula for Non-Native Speakers through Artificial Intelligence: A Conceptual and Applied Framework

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Article History	Abstract
Received 31 May 2026 Revised 16 August 2026 Accepted 31 August 2026	Generative artificial intelligence has renewed debate about how Arabic-language curricula are designed for non-native speakers, while curriculum production still depends on fixed sequences and delayed revision cycles. Arabic adds difficulties of diglossia, morphology, orthography, and the relation between Modern Standard Arabic and spoken varieties, and research on AI in language education remains uneven across tools and settings. This conceptual and applied framework paper therefore asks how AI may support curriculum construction for non-native learners. Adopting a conceptual framework-development approach, it synthesises curriculum principles, international proficiency references, and recent research into a staged design model whose components cover needs analysis, linguistic content design, content generation, expert validation, and adaptive assessment. Illustrative prototypes for reading, listening, and speaking show how those components may be connected, and the paper sets out the conditions for responsible use and later empirical testing. It argues that AI can make curriculum engineering more flexible and reduce production effort, while any benefit remains contingent on expert human review, contextual validation, and systematic evaluation. Abstrak <i>Kehadiran kecerdasan buatan generatif membuka peluang baru dalam pengembangan kurikulum bahasa Arab bagi penutur nonasli. Namun, pengembangan kurikulum masih kerap mengikuti urutan materi yang telah ditetapkan dan membutuhkan waktu relatif lama untuk diperbarui. Pengembangan kurikulum bahasa Arab juga menghadapi tantangan khusus, seperti diglosia, kompleksitas morfologi dan ortografi, serta hubungan antara bahasa Arab standar modern dan ragam bahasa lisan. Sementara itu, penelitian tentang pemanfaatan kecerdasan buatan dalam pendidikan bahasa masih beragam dalam hal perangkat dan konteks penerapannya. Penelitian ini bertujuan merumuskan kerangka konseptual dan terapan untuk pemanfaatan kecerdasan buatan dalam pengembangan kurikulum bahasa Arab bagi penutur nonasli. Dengan menyintesis prinsip pengembangan kurikulum, acuan internasional tingkat kemahiran bahasa, dan hasil penelitian mutakhir, penelitian ini mengusulkan model pengembangan bertahap yang mencakup analisis kebutuhan, perancangan materi kebahasaan, penyusunan konten dengan bantuan kecerdasan buatan, validasi oleh ahli, dan asesmen adaptif. Contoh rancangan materi membaca, menyimak, dan berbicara digunakan untuk memperlihatkan penerapan dan keterkaitan antarkomponen dalam model tersebut. Penelitian ini juga menguraikan persyaratan penggunaan kecerdasan buatan secara bertanggung jawab serta agenda pengujian empiris untuk penelitian selanjutnya. Kerangka yang diusulkan menunjukkan potensi kecerdasan buatan dalam meningkatkan fleksibilitas pengembangan kurikulum dan mengurangi beban penyusunan materi. Namun, pemanfaatannya tetap memerlukan penelaahan oleh ahli, pengujian kesesuaian dengan konteks pembelajaran, dan evaluasi yang sistematis.</i> المخلص أعاد الذكاء الاصطناعي التوليدي فتح النقاش حول كيفية تصميم مناهج اللغة العربية للناطقين بغيرها، في حين لا يزال إعداد المناهج يعتمد على تسلسل ثابت للمحتوى ودورات مراجعة تستغرق وقتاً طويلاً. وتتميز اللغة العربية بتحديات خاصة تشمل ازدواجية اللغوة، والصرف، والإملاء، والعلاقة بين العربية الفصحى الحديثة واللهجات المحكية. وفي المقابل، لا تزال البحوث المتعلقة باستخدام الذكاء الاصطناعي في تعليم اللغات متفاوتة من حيث الأدوات المستخدمة والسياقات التعليمية التي تتناولها. تهدف هذه الدراسة، بوصفها بحثاً في الإطار المفاهيمي وتطبيقاته، إلى استكشاف سبل توظيف الذكاء الاصطناعي في بناء مناهج اللغة العربية للناطقين بغيرها. واعتماداً على منهج تطوير الأطر المفاهيمية، تجمع الدراسة بين مبادئ تصميم المناهج، والمراجع الدولية لمستويات الكفاءة اللغوية،

والبحوث الحديثة، لتطوير نموذج تصميم مرحلي يشمل تحليل الاحتياجات، وتصميم المحتوى اللغوي، وتوليد المواد التعليمية، والتحكم من قبل الخبراء، والتقويم التكيفي. وتوضح نماذج تطبيقية أولية لمهارات القراءة والاستماع والتحدث كيفية الربط بين هذه المكونات، كما تحدد الدراسة شروط الاستخدام المسؤول للذكاء الاصطناعي ومسارات التحقق التجريبي مستقبلا. وتخلص الدراسة إلى أن الذكاء الاصطناعي يمكن أن يساهم في زيادة مرونة هندسة المناهج وتقليل الجهد اللازم لإنتاجها، غير أن تحقيق هذه الفوائد يظل مرهونا بالمراجعة البشرية المتخصصة، والتحقق من ملاءمة المحتوى للسياق التعليمي، والتقويم المنهجي.

Keywords: Adaptive assessment; artificial intelligence; curriculum development; digital learning environments; teaching Arabic as a foreign language

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Introduction

Accelerating technological transformation, particularly in generative artificial intelligence and deep learning, has intensified the need to reconsider how Arabic-language curricula are designed for non-native speakers. Traditional production relies on fixed sequences and delayed revision cycles, which sit uneasily with rapidly changing learner needs. A central concern is didactic transposition, the process through which complex knowledge becomes accessible instructional content without losing its disciplinary meaning, described by Sarrazy as “the engineering of knowledge transmission” that ensures the information reaches the learner with its scientific meaning intact (Sarrazy, 2002, p. 12). Curriculum principles similarly emphasise alignment among objectives, content, sequencing, and learner needs (Richards, 2012; Taima, 2006).

AI may support several stages of this work. Natural language processing can analyse linguistic datasets, identify frequent vocabulary, and generate draft texts. Such affordances are not pedagogical validity. Arabic raises difficulties of diglossia, morphology, orthography, and the relation between Modern Standard Arabic and spoken varieties, so generated materials require expert linguistic review, curricular alignment, and learner-centred evaluation (Alsaied, 2024; Amayreh, 2025; Hanandeh et al., 2024).

Research on AI in language education is expanding, but the evidence remains uneven across languages, tools, and settings. Arabic-language studies have examined AI-supported teaching, learner awareness, smartphone applications, speech and listening support, curriculum integration, and AI-driven learning behaviour (Adel, 2024; Al-Jamali, 2025; Alkaabi, 2025; Alsaied, 2024; Faqeeh, 2024; Hanandeh et al., 2024; Hijriyah, 2025; Sa'idah, 2024; Sapawi et al., 2025; Sismat, 2025; Usof, 2025). Broader research shows that generative AI can support task generation, self-directed learning, and adaptive feedback, while requiring teacher preparation, critical evaluation, and institutional safeguards (Kohnke et al., 2023; Yan, 2024; Evanick, 2025a, 2025b; Melo-López et al., 2025). Much of this work nevertheless treats tools separately and gives little attention to how needs analysis, linguistic progression, cultural content, human review, and assessment can be connected within one curriculum-engineering process (Sapawi et al., 2025; Hasani, 2021).

Recent work also distinguishes affordance from effectiveness. Studies of Arabic AI applications report opportunities for personalised learning, speech practice, and curriculum support, while noting that accuracy, teacher readiness, infrastructure, and evaluation quality remain decisive (Al-Shaboul, 2025; Amayreh, 2025; Al-Mallahma, 2025; Jawabreh, 2025). Technology is most useful when aligned with explicit proficiency goals rather than added as a standalone tool (Alfurochmatin & Jusoh, 2024; Munajat & Abidin, 2025; Putra et al., 2026), consistent with conceptual research that treats a framework as a basis for later testing (Hasani, 2021; Chen, 2025).

What remains open is the connection among these elements, which are discussed in separate literatures, and the order in which they must be assembled for a particular programme is rarely specified. For Arabic, that order is where the practical difficulty for curriculum designers lies.

Method

This paper adopts a conceptual framework-development approach rather than an empirical intervention design. Conceptual framework studies provide an organised structure for linking constructs, evidence, and proposed educational practices, while remaining open to later empirical testing (Hasani, 2021; Chen, 2025).

Sources were identified through structured searches of Scopus, Google Scholar, and regional Arabic-language education journals in September 2026, covering publications from 1986 to 2026. Regional journals were included where they publish peer-reviewed research on teaching Arabic as a foreign language not indexed in Scopus; *Alsina: Journal of Arabic Studies* is named for that reason alone. Search strings combined Arabic with curriculum, syllabus, proficiency, and teaching Arabic to non-native speakers, and with artificial intelligence, generative AI, large language models, ChatGPT, adaptive learning, and automated assessment. Records were retained if they addressed Arabic teaching or curriculum design, reported or theorised AI in language education, or described a relevant proficiency framework, and excluded if they concerned Arabic natural language processing without instructional application, or were editorials, abstracts, or non-peer-reviewed reports.

Retained sources were examined thematically, following thematic synthesis in educational review research (Başaran, 2024), with attention to Arabic curriculum design, proficiency frameworks, generative AI, adaptive learning, assessment, teacher readiness, and governance. Coding followed the curriculum stages named in the research question and was grouped into the five components reported below. The synthesis compared the requirements of CEFR, ACTFL, and UAE standards, mapped AI affordances onto curriculum stages, and specified human-review and evaluation conditions.

Validation is proposed along three dimensions: machine-supported analysis and generation, expert pedagogical and linguistic review, and learner-centred classroom evaluation, a structure meant to preserve human judgement while making AI use transparent and testable. Future studies should report databases, search dates, inclusion criteria, system versions, prompts, editing procedures, review rubrics, participant characteristics, outcome measures, and analytic procedures.

The paper is confined to a conceptual and applied framework for AI in the design of Arabic curricula for non-native speakers. It reports no field experimentation, registered review, psychometric evaluation, or comparison of learner outcomes, and should be read as a structured proposal whose transferability depends on learner age, proficiency, purpose, Arabic variety, infrastructure, teacher expertise, data governance, and the selected system.

Results

Because this is a conceptual and applied framework paper, this section reports the outputs of synthesis rather than participant outcomes, experimental effects, or statistical tests. It moves from conceptual foundations and construction principles, through international frameworks, to the proposed framework, its prototypes, and a comparison of traditional and AI-supported models.

Conceptual Foundations

The theoretical and methodological framework is the cornerstone of any study that seeks to develop and modernise curricula, since possessing modern technical tools is not in itself sufficient to ensure the success of the educational process. What is required is a precise understanding of the nature of the curriculum and its components (Belaid, 2005).

The Concept of the Curriculum

Linguistically, *manhaj* derives from *nahaja*, to tread a clear path, as in the verse “{To each among you We have prescribed a law and a way (*shir‘ah wa-minhāj*)}” (Ibn Manzur, 1414 AH). Terminologically, the curriculum is now a comprehensive system of organised educational experiences that an institution plans inside and outside its walls, aiming at intellectual, physical, social, and psychological growth (Al-Wakil & Al-Mufti, 2017).

In the context of teaching Arabic to non-native speakers, the curriculum is defined as “an integrated educational system that aims to enable the foreign learner to use Arabic for communication and thought by developing the four language skills within a sequential structure that progresses from the simple to the complex” (Taima, 2006).

Scientific Methodology

Methodology is the science of studying curricula, the theoretical framework governing how educational processes are conducted. In educational planning it is “the science of methodological planning”, the procedural framework determining how content is selected, organised, and evaluated against specific objectives (Belaid, 2005).

Curriculum and Methodology Compared

The distinction between curriculum and methodology can be examined through their respective nature, scope, epistemic connection, and timing within the research or instructional planning process. These dimensions are summarised in Table 1.

Table 1 Comparison Between Curriculum and Methodology

Point of comparison	Curriculum: Method	Methodology
By nature	The direct procedural path or instrument (such as the descriptive or experimental method) for arriving at truth.	The overarching plan and the philosophical justification that explains why and how this method was chosen over others.
By scope	The curriculum focuses on the practical and technical aspects of collecting and analysing data.	Methodology is broader and more comprehensive, combining techniques, means, and rules for achieving goals.
By epistemic connection	The curriculum is linked to applied sciences and tools.	Methodology is linked to philosophy and the intellectual paradigm from which the researcher or teacher proceeds.
By timing	Methodology is determined at a very early stage of planning.	The curriculum is selected as a tool at later stages on the basis of that methodology.

As shown in Table 1, curriculum and methodology operate at different conceptual levels. The curriculum functions as a practical instrument for organising content and procedures, whereas methodology provides the broader rationale and epistemic basis for selecting and organising those procedures.

Foundations of Curriculum Construction

The knowledge revolution led by artificial intelligence necessitates curricula built on clear scientific foundations that ensure sound planning and effective implementation. These foundations appear as “educational bases”, which require the four curriculum components to be integrated in a fixed order (Kim, 2023; UNESCO, 2025).

Educational Foundations

Instructional objectives come first. General objectives express the broad, long-term ends of the curriculum, and Richards stressed their importance in clarifying its purpose, guiding teachers and learners, and describing achievable changes in the learning trajectory (Richards, 2012).

Specific objectives are tied to particular topics and vary to include procedural, behavioural, and communicative objectives; an example is that the student listens to a short dialogue and identifies basic information such as name and nationality (Taima, 2006).

Content selection is the essential pillar, requiring the selection of topics according to criteria related to the objectives, their scientific accuracy, and their cultural appropriateness (Al-Wakil & Al-Mufti, 2017). Content organisation rests on the principles of sequencing, integration, and continuity (Al-Naqa, 2006).

Evaluation aims to measure behavioural change in the learner and includes classifying learners, diagnosing strengths and weaknesses, and guiding teachers toward improving their teaching methods (Taima, 2004).

Once objectives and content are settled, teaching method and instructional strategies come into play. Richards and Rodgers (1986) urged caution in selecting a method, since none suits all settings and compatibility among approach, objectives, and target level must hold. Generative AI adds adaptive learning through intelligent algorithms that accommodate individual differences (UNESCO, 2023), interactive simulation and augmented reality, and digital collaborative learning through discussion groups supported by automated analysis.

Psychological Foundations

Psychological foundations direct instructional material towards the learner's nature and needs. Attention to linguistic growth and readiness matters most: materials must match the learner's developmental stage while allowing for differences in learning speed, since early success conditions the desire to continue (Al-Naqa, 2006).

Motivation drives learning in its integrative, instrumental, intrinsic, and extrinsic forms, and can be strengthened by linking learning to real life and setting short-term goals (Cook & Singleton, 2019). Individual differences require the designer to diversify objectives, content, methods, and assessment (Mar'i & Al-Hila, 2000).

Social and Cultural Foundations

Social foundations follow from the relationship between language, society, and culture, which requires cultural elements in instructional content. Arab culture matters especially for its connection to Islamic culture, a major motivation for many learners, and the curriculum should span local, general Arab, Islamic, and world culture.

Linguistic Foundations

Linguistic foundations are the core pillar for Arabic, comprising the rules that govern selection and organisation of content and requiring precision in distributing vocabulary and structures along a graded scale that respects the learner's level (Taima, 2006). Their criteria include adherence to Modern Standard Arabic, balance between receptive and productive skills, and integration of the linguistic and cultural dimensions.

The linguistic foundations of Arabic curriculum design can be further specified through criteria concerning content presentation, proficiency levels, content preparation, teaching approach, language use, language skills, and cultural integration. These criteria are presented in Table 2.

Table 2 Essential Linguistic Criteria for Arabic Curriculum Design

Domain	Essential criteria of the linguistic foundations
Data and output	Clarity of author and publisher details, attention to vocalisation (<i>tashkīl</i>) for beginners, and use of illustrative images to reinforce direct comprehension and dispense with translation.
Proficiency levels	Adopting international frameworks (ACTFL or CEFR) to divide levels (beginner, intermediate, advanced) in order to ensure graded skills and distinguished learning outcomes.

Domain	Essential criteria of the linguistic foundations
Content preparation	Studying learners' characteristics, selecting the most frequent vocabulary, and diversifying attractive texts (dialogues, everyday situations) to encourage creativity rather than mechanical repetition.
Teaching approach	Gradation (from easy to difficult, from concrete to abstract) and linking the elements of language and its four skills within integrated units.
Language of the book	Adherence to Modern Standard Arabic (MSA) in structures and texts, and avoidance of hybrid or intermediate language to preserve the integrity of linguistic competence.
Language skills	Achieving balance between receptive skills (listening and reading) and productive skills (speaking and writing) in authentic communicative situations that simulate reality.
Cultural integration	Linking the linguistic and cultural dimensions (national, Arab, Islamic, and world culture) to develop pragmatic competence and the capacity for linguistic immersion.

Table 2 demonstrates that linguistic curriculum design involves more than the selection of vocabulary and grammatical structures. It requires systematic progression across proficiency levels, integration of the four language skills, appropriate use of Modern Standard Arabic, and coordination between linguistic and cultural dimensions.

These foundations define what a curriculum must contain; international frameworks define the standards against which that content is described.

International Reference Frameworks

The Common European Framework of Reference for Languages (CEFR)

The Common European Framework of Reference for Languages (CEFR) is an international system established by the Council of Europe to describe proficiency uniformly. It is descriptive rather than prescriptive, dividing ability into six levels from A1 to C2 across listening, speaking, reading, and writing, and has become the recognised reference for curriculum design and test construction (Council of Europe, 2001).

The American Framework for Foreign Language Teaching (ACTFL)

The American Council on the Teaching of Foreign Languages (ACTFL) formulates standards for assessing proficiency in its Proficiency Guidelines, which classify learners from Novice to Distinguished, and is known for standardised instruments, most notably the Oral Proficiency Interview, which measures communicative ability in real situations (ACTFL, 2024).

The UAE Curriculum Standards for Teaching Arabic to Non-Native Speakers

The national document for Arabic as a subject for non-native speakers in the United Arab Emirates integrates scientific and linguistic content to strengthen learners' thinking and analytical skills, connecting education to social and environmental reality. Its vision reconciles global educational needs with the preservation of identity through religious, ethical, and human values (Ministry of Education, 2011).

Comparison of the CEFR and ACTFL Frameworks

CEFR and ACTFL provide two established reference frameworks for describing language proficiency, but they differ in their organisational principles, level structures, and emphasis on communicative performance. The principal points of comparison are presented in Table 3.

Table 3 Comparison of the CEFR and ACTFL Reference Frameworks

Point of comparison	European reference framework	American framework
Developing body	Council of Europe.	American Council on the Teaching of Foreign Languages.
Philosophy and approach	Descriptive: focuses on "What can the learner do?"	Performance-based: focuses on "How does the learner perform the language?" in real-world situations.

Point of comparison	European reference framework	American framework
Structuring of levels	Six levels: Beginner: (A1, A2) Intermediate: (B1, B2) Advanced: (C1, C2)	Five levels: Novice Intermediate Advanced Superior Distinguished
Central focus	Comprehensive communicative competence and linguistic abilities.	Functional performance and interaction in everyday life contexts.
Geographic spread	Widely used across Europe and internationally, with adaptations in many educational systems.	The primary reference in the United States and its affiliated institutions.

Table 3 shows that CEFR and ACTFL differ in how proficiency levels are organised and how language ability is conceptualised. CEFR runs from A1 to C2, while ACTFL uses Novice, Intermediate, Advanced, Superior, and Distinguished, a comparison that indicates how international frameworks can inform Arabic curriculum design.

Diglossia and Register as Design Constraints

None of these frameworks was designed for a language with Arabic's register range. CEFR and ACTFL describe what a learner can do but not which variety the learner is doing it in, and for Arabic that omission matters: a learner who reads a newspaper in Modern Standard Arabic may be unable to follow a market conversation, and a curriculum that treats proficiency as a single ladder misdescribes both achievements.

Three decisions follow. The framework is scoped to Modern Standard Arabic, and the prototypes are MSA throughout, a deliberate limitation rather than a claim of sufficiency: programmes preparing learners for employment, community participation, or religious study will need a spoken variety, for which a parallel specification would be required. Register is treated as a design parameter rather than an accident of generated text: each prototype names the register it targets and excludes, and validation checks for unintended mixing. Assessment must sample the variety taught, since a test in MSA cannot establish that a learner can negotiate a price in the dialect of the city where they study.

These decisions do not resolve the diglossia problem, which no curriculum framework has resolved. They do make the framework's position explicit, so that a programme adopting it knows which variety it is adopting and what it will still need to add.

Proposed AI-Assisted Curriculum Framework

The synthesis yields five interconnected components: needs analysis, linguistic content design, AI-supported content generation, expert validation and revision, and adaptive assessment. They form a staged architecture rather than a list. Needs analysis converts learner data into a proficiency profile and communicative priorities; content design turns that profile into vocabulary bands, structural targets, and a balance across the four skills referenced to CEFR or ACTFL; generation turns those specifications into draft texts, dialogues, audio, and images. Validation operates as a gate rather than a stage, since no artefact reaches the learner until an expert has confirmed its accuracy, level alignment, cultural appropriateness, and task difficulty. Adaptive assessment returns performance evidence to the first component, so that the profile is revised rather than fixed.

The architecture is sequential at validation and iterative elsewhere. Generation may be repeated, but the gate is crossed once per artefact and its decision recorded, which makes the process auditable. The unit of design is the transition between components, not the capability of any single system.

The framework also operationalises didactic transposition, which requires disciplinary knowledge to be restructured into teachable content without loss of meaning. Generation performs the first movement, from

linguistic description to instructional text, and validation performs the second, checking that the transformation has not altered the linguistic fact it carries. Diglossia makes this check non-trivial, since a text may be well formed in Modern Standard Arabic and still pragmatically implausible for the situation it depicts.

The scope of the paper should be stated plainly. Components one to three are illustrated below. Component four is specified as a review protocol rather than demonstrated, since no expert panel was convened, and component five is not prototyped, remaining a design requirement for a later study. Figure 1 presents the resulting architecture, its five components and the sequence in which they are traversed. The models and tables that follow show how the components may be connected, not validated outcomes.

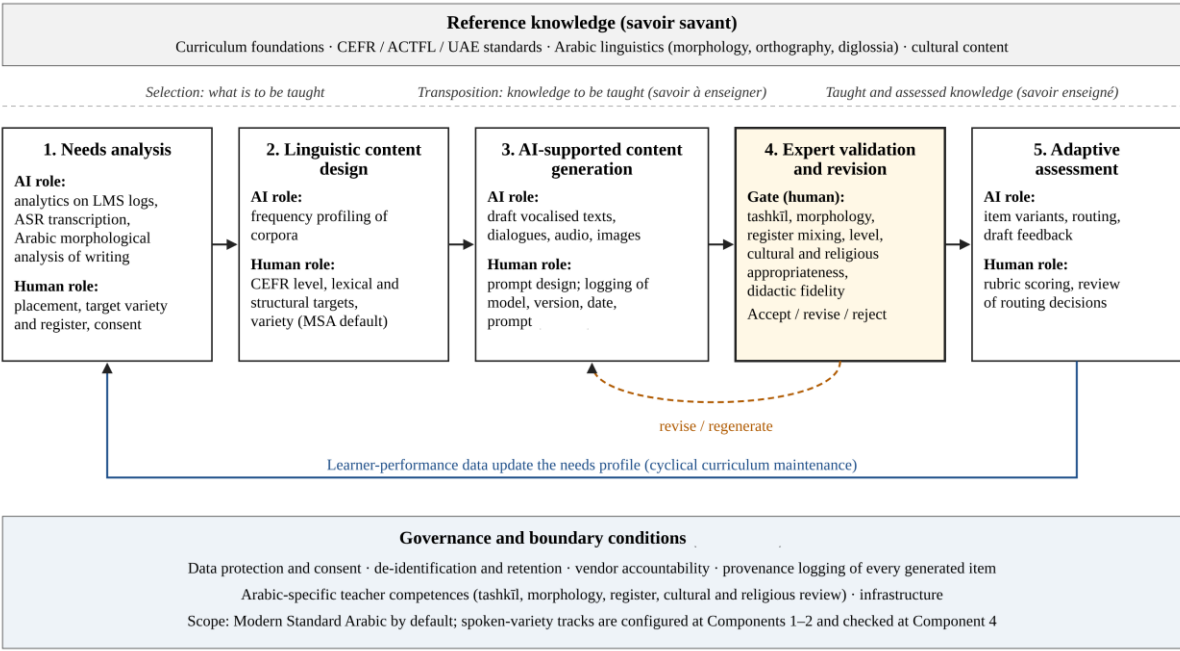


Figure 1 Five-Component Architecture of the AI-Assisted Arabic Curriculum Framework

Illustrative Prototypes

The credibility of the framework depends on whether its exemplars can be inspected, so the production method should be stated. Each prototype came from an iterative human-AI workflow: prompts specified the target level, communicative function, vocabulary band, structural target, and length; the first output was revised and checked against the specification. The systems in Tables 5 to 7 were those used at the time of writing, and tool identity is substitutable, since what matters for replication is the specification rather than the vendor. Researchers should record model name and version, access date, prompt text, and edits.

Needs Analysis

Needs analysis begins from learner data. Table 4 links potential data sources with the information they may yield, candidate tools, and the curriculum decisions these data could inform. The matrix is a proposed planning framework, not data collected or analysed here.

Table 4 Proposed Data Sources and Intelligent Tools for Needs Analysis

Source	Extracted data	Proposed tool
Learning management system (LMS) records	Patterns of common errors, mastery rates, response time.	Learning analytics + ChatGPT API
Initial placement tests	Knowledge level, gaps in the four language skills.	Moodle quiz engine + item calibration with GPT-4o
Smart digital questionnaires	Professional needs, motivations, cultural context.	Google Forms + Typeform AI + Claude AI

Source	Extracted data	Proposed tool
Automated writing analysis	Level of syntactic structure, vocabulary, style.	CAMeL Tools / Farasa (Arabic morphological analysis)
Automatically transcribed audio interviews	Fluency, pronunciation, discourse coherence.	Whisper AI + automated linguistic analysis
Analysis of academic texts and construction of diagnostic questions	Identifying knowledge gaps and proposing customised remedial pathways for each learner.	Claude AI (Anthropic)

As Table 4 shows, learner-data sources provide complementary information: LMS records, placement tests, questionnaires, writing samples, audio interviews, and academic texts can inform decisions about proficiency, needs, and remedial pathways. Two entries need qualification. Arabic writing analysis requires morphological work that mainstream English checkers do not perform, so CAMeL Tools and Farasa are specified for segmentation and tagging. Placement testing cannot be delegated to a language-learning application, whose level estimates are not calibrated to CEFR or ACTFL descriptors.

Content Design: A Graded Reading Text

This framework component concerns the conversion of learner profiles and needs-analysis results into integrated curricular content. The following examples are illustrative prototypes rather than validated intervention outcomes. Before classroom use, each output should be reviewed for linguistic accuracy, proficiency-level alignment, cultural appropriateness, task difficulty, accessibility, and compliance with the target curriculum framework.

Generative AI supports this component by processing lexical databases, selecting frequent vocabulary, and producing provisional texts in Modern Standard Arabic, as studies of curriculum support, lexical development, speech recognition, and listening practice suggest (Alkaabi, 2025; Al-Shaboul, 2025; Allaithy, 2026; Hijriyah, 2025; Rouabhi, 2024). Each output requires expert validation for linguistic accuracy, level alignment, cultural appropriateness, task difficulty, accessibility, and compliance with the target framework.

The conversion of learner needs into instructional content can be illustrated through a beginner-level reading lesson. Table 5 presents a prototype in which a short reading text is accompanied by targeted vocabulary, verbs, and grammatical structures.

Table 5 Illustrative Beginner-Level Reading Prototype: The Market

Model (1): An AI-generated text for the beginner level: reading skill (lesson: The Market)
Siraj went to the market this morning; he saw plenty of fruit: apples, bananas, and oranges. He asked the seller: "How much is a kilogram of oranges?" The seller said: "Five riyals per kilogram." Siraj bought two kilograms for ten riyals and returned home.
Target nouns: market, fruit, seller, price, kilogram.
Target verbs: went, saw, asked, bought, returned.
Target structure: verbal sentence (verb + subject + object).
Common simple vocabulary: verbal sentence ← short dialogue.

Table 5 illustrates how an AI-assisted reading prototype can integrate vocabulary, verb forms, and a target sentence structure within a single contextualised text. The example also demonstrates how linguistic targets can be embedded in a communicative situation rather than presented as isolated language items. The prototype requires expert review before classroom implementation.

Visual materials can complement a beginner-level reading text by providing contextual cues for unfamiliar objects and actions. The proposed visual support for the reading lesson in Table 5 is presented in Figure 2.



Figure 2 AI-Generated Story Sequence and Lesson Card for the Reading Lesson: The Market

Figure 2 provides visual contextualisation for the reading lesson by connecting the text with recognisable objects and actions, with panels (1) to (4) retelling the text as a short sequence from Siraj's arrival at the market to his return home with the purchase, and the lesson card assembling the same text with its target nouns, target verbs, and target structure. Such visual support may facilitate initial comprehension, although its linguistic, pedagogical, and cultural suitability requires expert review before instructional use.

Graded Texts for Listening

For listening, AI-assisted generation can be organised into progressively more demanding tasks and texts. Table 6 presents a sequence for A Letter from London in which one narrative is revisited at three levels of demand, so that progression is cumulative rather than a set of unrelated tasks, with the tools, communicative functions, and audio materials shown for each level.

Table 6 Graded Listening Materials for A Letter from London

Proposed tool	Communicative function	Generated audio text
ElevenLabs for converting text into natural Arabic speech with a clear, slow tone	Recognising basic vocabulary and understanding simple nominal sentences by linking the image with the heard word.	A short illustrated audio clip: “This is my postman; he has brought a letter,” supported by the 12 attached vocabulary cards (postman, letter, doorbell...).
Grok AI for producing illustrated scenes + Claude AI for composing the vocalised text + Siraj platform for publishing	Understanding everyday dialogue, grasping the sequence of events and functional expressions, and verifying comprehension through an interactive true/false exercise.	A 4:48-minute educational video: a dialogue between Siraj and the postman at the door about a letter that has arrived from Hassan in London, with hand-drawn scenes embodying the story’s events.
NotebookLM for creating an educational podcast in a narrative style + Whisper AI	Comprehending heard MSA, understanding the emotional context, and extracting implicit	An extended narrative report in Hassan’s own voice: Hassan works in a clothing factory in London and writes to Siraj about life there, including a description of the city and feelings

Proposed tool	Communicative function	Generated audio text
for analysing listening comprehension	information from a complex narrative text.	of estrangement and longing. The letter is the same object that Siraj receives in the previous row.

Table 6 illustrates a progression from basic vocabulary recognition and simple sentence comprehension toward understanding longer narratives and extracting implicit information. The sequence represents a proposed instructional design principle; it does not constitute evidence of measured improvement in listening performance.

The graded listening materials presented in Table 6 can be complemented by visual scenes that provide contextual cues before and during exposure to the spoken text. Figure 3 presents the proposed visual support for *A Letter from London*. The example illustrates a possible use of AI-generated visuals in graded listening materials rather than evidence of improved listening performance.

Figure 3 consists of four panels. Panel (a) is titled 'خسبُ يُزِيلُ رسالةً إلى والده' and shows a postman in a blue uniform delivering a letter to a man in a red vest and a young boy. Panel (b) is titled 'يُكْتُبُ خَسْبُ رسالةً في لندن' and shows a man sitting at a desk, writing a letter. Panel (c) is titled 'مفردات الدرس' and displays twelve numbered vocabulary cards in Arabic. Panel (d) is titled 'التعبير الحق - مع/بدون (X)' and shows a comprehension exercise with true/false questions in Arabic.

Figure 3 AI-Generated Scenes, Vocabulary Cards and Comprehension Exercise for the Listening Text – A Letter from London

Figure 3 combines two narrative scenes, (a) and (b), with the twelve Stage 1 vocabulary cards from the published materials in panel (c) and the interactive true/false exercise that checks comprehension of the letter story in panel (d). These cues correspond to the narrative context of the listening material. These cues are intended to support learners in establishing contextual meaning as the level of the narrated text becomes more complex. Their actual contribution to listening comprehension would require empirical evaluation.

Graded Dialogues for Speaking

A speaking curriculum can similarly combine graded communicative functions with contextualised visual materials. The graded dialogue sequence for the lesson Siraj in the Market is set out in Table 7.

The speaking component can be structured by progressively increasing the complexity of communicative functions and language production. Table 7 presents graded dialogue examples for Siraj in the Market, linking each communicative function to a proposed proficiency level and an AI-assisted production process.

Table 7 Graded Speaking Dialogues for Siraj in the Market

Proposed tool	Communicative function	Generated dialogue	Level
Claude AI for generating the vocalised dialogue text	Asking about the price	بِكَمْ كَيْلُو الْبُرْتُقَالِ يَا عَمُّ؟ (How much is a kilogram of oranges, uncle?)	A1 Beginner
Grok AI for generating images and visual scenes	Answering with numbers and expressing the price	خَمْسَةُ رِيَالَاتٍ لِلْكَيْلُو يَا بُنَيَّ. (Five riyals per kilogram, my son.)	A1
Claude AI for generating graded contextual dialogues	Formulating a request politely	أَعْطِنِي كَيْلُونَيْنِ مِنْ فَضْلِكَ. (Give me two kilograms, please.)	A2 Elementary
Grok AI for producing illustrative images of market scenes	Expressing quantities and forms of thanks	[Seller:] Five riyals per kilogram, my boy. [Buyer:] Here you are, uncle. Thank you very much.	A2 Elementary
Claude AI for constructing complex family dialogues	Reasoning and description with complex sentences	لِمَذَا تَأَخَّرْتَ يَا سِرَاجُ؟ كَانَ السُّوقُ مُزْدَحِمًا يَا أُمِّي. (Why are you late, Siraj? The market was crowded, mother.)	B1 Intermediate
Grok AI + Claude AI for combining the vocalised text with visual scenes into an integrated educational video	Expressing achievement and praise	تَفَضَّلِي يَا أُمِّي، اشْتَرَيْتُ كَيْلُونَيْنِ بَعَشْرَةَ رِيَالَاتٍ. بَارَكَ اللَّهُ فِيكَ يَا بُنَيَّ، أَنْتَ وَلَدٌ مُجْتَهِدٌ. (Here, mother; I bought two kilograms for ten riyals. May God bless you, my son; you are a diligent boy.)	B1 Intermediate

Table 7 demonstrates how communicative functions can be differentiated according to proficiency level, beginning with basic requests and price-related exchanges and progressing toward more complex reasoning and description. The examples illustrate a possible framework for differentiated speaking practice rather than validated learning outcomes.

The graded speaking activities can be further supported through visual scenes that represent the participants and sequence of the dialogue. The proposed visual support for the speaking lesson is presented in Figure 4.



Figure 4 AI-Generated Scenes for the Graded Dialogue Lesson:
Market Exchange (A2) and Family Exchange (B1)

Figure 4 makes the roles and progression of the speaking dialogue more visually explicit, with panel (a) showing the market exchange and panel (b) the family exchange. The scenes provide contextual support for the communicative exchanges in Table 7, while speaker identification and linguistic accuracy should be checked before the materials are used in classroom instruction.

The dialogue lesson is further supported by structural and lexical reference materials. Figure 5 presents the conversation structures and the lesson vocabulary that accompany the graded dialogues in Table 7. These materials serve as supporting resources within the proposed framework, while their specific contribution to language learning would require empirical evaluation.

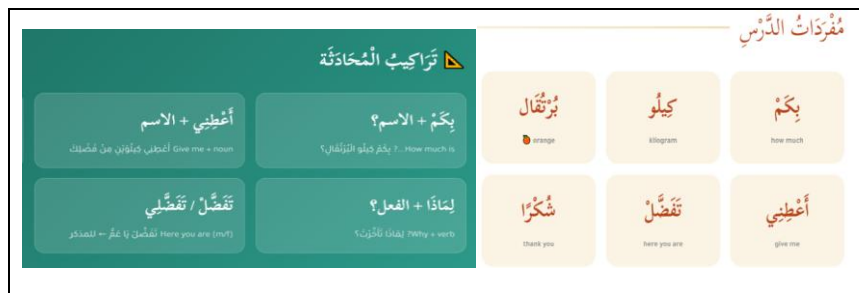


Figure 5 Conversation Structures and Lesson Vocabulary for the Dialogue Lesson

Figure 5 makes the sentence patterns and lexical items on which the graded dialogues depend available for inspection, so that learners can see the structures they are expected to produce. Their specific contribution to language learning would require empirical evaluation.

Traditional and AI-Supported Curricula Compared

The proposed AI-assisted curriculum differs from a conventional static curriculum in the way it approaches needs analysis, content development, learning activities, feedback, media, curriculum maintenance, and assessment. These proposed differences are summarised in Table 8.

Table 8 Traditional and AI-Supported Curriculum Models Compared as a Design Hypothesis

Comparison criterion	Traditional curriculum (Static)	AI-based curriculum (Dynamic/Adaptive)
Needs analysis	Manual questionnaires and interviews; static results that may become outdated.	Frequent analysis of learning management system (LMS) data, with results updated as data accumulate
Selection of linguistic material	Vocabulary lists established through expert judgement and prior syllabus practice.	Computational analysis of linguistic corpora to measure actual frequency
Content construction and generation	Authoring cycles measured in months or years, with corresponding production cost.	Potentially rapid, adaptive content generation at lower marginal cost, with scope for individualisation
Activities and exercises	Limited routine activities focused on memorisation and achievement.	Renewable interactive exercises whose difficulty is graded dynamically according to learner performance
Feedback	Delayed and collective, relying on the teacher's effort.	Rapid and individual, with automated remedial pathways subject to teacher review
Visual design and media	Printed texts and static images requiring designers.	Intelligent generative media (images, video, augmented reality) that enhance linguistic immersion
Sustainability and development	Infrequent periodic reviews and complex amendment procedures.	Potentially continuous updating based on live data analysis, subject to periodic expert review
Assessment	Fixed paper-based tests that measure achievement only.	Adaptive tests whose difficulty is adjusted item by item, intended to sample understanding rather than recall

Table 8 presents the proposed shift from fixed curriculum processes towards adaptive ones supported by learner data and generative AI. Two caveats apply. The right-hand column describes an ideal type rather than the practice of any particular programme, since many established curricula already combine fixed and

adaptive elements, and the left-hand entries are design expectations from the literature, not measured differences. Adaptive implementation would also require validation, governance, infrastructure, and continuous monitoring.

Discussion

The discussion interprets the framework outputs in relation to the recent literature, considers their pedagogical significance, and identifies the conditions under which the proposed model could be tested empirically.

Contribution to Curriculum Design and Language Education

The framework contributes in three ways. It treats AI as one component of curriculum engineering rather than a substitute for curriculum theory or teacher judgement, consistent with work that frames generative AI as a co-educator whose value depends on human-AI collaboration and institutional support (Evanick, 2025a, 2025b). It connects AI affordances to established proficiency references, including CEFR, ACTFL, and UAE standards, rather than letting tool capabilities determine progression. And it places validation and governance alongside generation, which matters for Arabic, where diglossia, morphology, orthography, and cultural representation affect the suitability of generated materials.

The framework's principal advantage is that it connects AI affordances to curriculum logic rather than treating AI as a stand-alone instructional tool. It links needs analysis, proficiency references, linguistic progression, content generation, human validation, and assessment within one design sequence. This integrated structure may help curriculum developers move from isolated experimentation toward more coherent planning (Hasani, 2021; Chen, 2025).

Pedagogical Opportunities and Practical Value

The framework also clarifies the difference between affordance and effectiveness. Studies of Arabic AI applications report promising uses in listening, speech, curriculum support, and learner awareness, but do not justify a general claim that AI-based curricula improve learning everywhere. Effectiveness is likely to depend on alignment among learner needs, proficiency targets, teacher expertise, infrastructure, and the quality of human review.

Several benefits follow. AI may shorten the time needed to draft differentiated materials, generate varied practice, and adapt content to learner profiles, especially in Arabic for vocabulary selection, listening materials, speech practice, and multimodal learning (Alkaabi, 2025; Hijriyah, 2025; Putra et al., 2026). The benefits remain conditional, since the framework has not been evaluated in a controlled learner study.

Risks, Constraints, and Governance Considerations

The benefits are accompanied by substantial risks. Automated generation may reproduce linguistic inaccuracies, cultural simplifications, or inappropriate difficulty levels; personalisation may require collecting sensitive learner data; and adaptive assessment can create opaque decisions when criteria are undocumented. Excessive reliance may weaken teacher agency, student independence, and academic integrity, which supports a cautious position: AI is a provisional support subject to expert judgement, not an autonomous curriculum designer (Evanick, 2025a, 2025b; Melo-López et al., 2025).

Beyond these risks, integration faces structural obstacles. Technical and material obstacles consist in weak infrastructure, such as high-speed connectivity and data centres, and in investments that burden the budgets of educational systems, especially in developing countries. Ethical and security risks include algorithmic bias, the privacy of student data, and threats to academic integrity. Any implementation using LMS records, placement tests, writing samples, or audio interviews should specify the lawful basis or informed consent, de-identification, retention period, access controls, vendor use of data, cross-border transfers, and

procedures for correcting harmful outputs, consistent with recent work on governance and human oversight (Evanick, 2025a, 2025b; Melo-López et al., 2025; Moustafa, 2026).

The human and cultural obstacle appears in the shortage of specialised expertise and in resistance to change, together with the risk that digital self-learning erodes collaborative skills. The language and content obstacle concerns the scarcity of digital resources in Arabic compared with English, which requires Arabising content and producing local materials. Taken together, these conditions indicate that AI is not a substitute for the teacher but a supporting force whose use requires policies balancing investment in technology with educational values and scientific integrity (UNESCO, 2025).

Limitations and Directions for Future Research

The paper has several limitations. The framework rests on conceptual synthesis rather than a registered review or field intervention, the illustrative outputs were not evaluated in a controlled learner study, and no psychometric evidence supports the proposed assessments. The search was targeted rather than exhaustive, and the literature remains uneven across varieties, populations, and settings.

Future research should pilot individual components before full-scale implementation. Priority studies include expert ratings of AI-generated Arabic materials, comparisons of human-authored and AI-assisted materials, learner studies with transparent outcome measures, analyses across proficiency levels and varieties, and investigations of privacy, bias, and teacher workload.

Conclusion

The distinguishing contribution of this conceptual work is structural rather than empirical. What separates an AI-assisted Arabic curriculum from a tool-centred account is not the capability of any system but the point at which human judgement enters: validation operates as a gate that every artefact must cross, and the decision is recorded. Generation performs the first movement of didactic transposition and validation the second, which is why the arrangement can be audited while saying nothing about learning outcomes.

Three weaknesses follow from the same design. Expert validation is specified as a protocol but was not exercised by a panel; adaptive assessment is described as a requirement but was not implemented; and the framework is scoped to Modern Standard Arabic, so the spoken varieties many programmes require fall outside it. Each marks a component whose behaviour under real curricular constraints remains unknown.

Three priorities follow. Inter-rater studies should establish whether the validation gate can be applied consistently by different reviewers; pilot implementations should determine whether the assessment component can close the loop it is designed to close; and work on spoken varieties should establish whether the framework extends to them or needs a parallel specification. Until such evidence is available, the framework is best used to discipline curriculum decisions that are already being made.

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Conflict of Interest

The authors declare no competing financial or non-financial interests.

Declaration of AI Use

Generative artificial intelligence was used to produce the illustrative prototypes in Tables 5 to 7 and Figures 1 to 5, using the systems named in those tables: Claude, Grok, ElevenLabs, NotebookLM and Whisper. Prompts were written by the authors, and every output was reviewed, revised and checked against the target proficiency level before inclusion; the materials remain illustrative rather than validated teaching resources. The manuscript text was written and revised by the authors without AI assistance. The authors verified all AI-assisted output and take full responsibility for the content.

References

- Adel, M. A. (2024). The contribution of smartphone apps to develop teaching the Arabic language: “Arabic Is My Language” app as a sample. *Forum for Linguistic Studies*, 6(6), 1175–1190. <https://doi.org/10.30564/fls.v6i6.7408>
- Alfurochmatin, A., & Jusoh, A. M. B. M. (2024). Tren pengembangan media pembelajaran bahasa Arab di Indonesia era 5.0 [Trends in the development of Arabic learning media in Indonesia in the 5.0 era]. *Alsina : Journal of Arabic Studies*, 6(1), 1–26. <https://doi.org/10.21580/alsina.6.1.21278>
- Al-Jamali, S. (2025). Behavioral determinants of AI-driven Arabic language learning: Insights from the extended UTAUT2 model. *Educational Process International Journal*, 16. <https://doi.org/10.22521/edupij.2025.16.282>
- Alkaabi, M. H. (2025). Generative AI implementation and assessment in Arabic language teaching. *International Journal of Online Pedagogy and Course Design*, 15. <https://doi.org/10.4018/IJOPCD.368037>
- Allaithy, A. (2026). Evaluation of AI-generated reading comprehension materials for Arabic language teaching. *Computer Assisted Language Learning*, 39(5–6), 1296–1328. <https://doi.org/10.1080/09588221.2025.2474037>
- Al-Mallahma, M. S. I. (2025). Exploring the use of AI-powered applications in Arabic language teaching and assessment. *Studies in Systems, Decision and Control*, 587, 2217–2227. https://doi.org/10.1007/978-3-031-87584-7_160
- Al-Naqa, M. K. (2006). *Ta’līm al-lughah al-‘Arabīyah lil-nāṭiqīn bi-lughāt ukhrā: Ususuḥu, madākhiluhu, ṭuruq tadrīsihi* [Teaching Arabic to speakers of other languages: Foundations, approaches, and methods] (3rd ed.). Arabic Language Institute, Umm Al-Qura University.
- Alsaied, M. A. (2024). The contribution of artificial intelligence technologies in refining the Arabic language skills of its native speakers: Achieved and possible. *Journal of Ecohumanism*, 3(8), 4783–4797. <https://doi.org/10.62754/joe.v3i8.5126>
- Al-Shaboul, I. A. (2025). Bridging the gap: The role of artificial intelligence in enhancing Arabic language learning, translation, and speech recognition. *Research Journal in Advanced Humanities*, 6(2). <https://doi.org/10.58256/17f30w24>
- Al-Wakil, H. A., & Al-Mufti, M. A. (2017). *Usus binā’ al-manāhij wa-tanzīmātihā* [Foundations of curriculum construction and organisation] (10th ed.). Dar al-Masira for Publishing, Distribution and Printing.
- Amayreh, M. I. (2025). The reality of Arabic language in AI applications: An applied descriptive study. *Dirasat: Human and Social Sciences*, 52(2), 459–471. <https://doi.org/10.35516/hum.v52i2.6352>
- American Council on the Teaching of Foreign Languages. (2024). *ACTFL proficiency guidelines 2024*. <https://www.actfl.org/educator-resources/actfl-proficiency-guidelines>

- Başaran, M. (2024). Meta-thematic synthesis of research on early childhood coding education: A comprehensive review. *Education and Information Technologies*, 29(16), 20795–20822. <https://doi.org/10.1007/s10639-024-12675-2>
- Belaid, S. (2005). *Fī al-manāhij al-lughawīyah wa-i 'dād al-abhāth* [On linguistic curricula and research preparation]. Dar Houma for Printing, Publishing and Distribution.
- Chen, B. (2025). Integrated STEM curriculum design: A conceptual framework and visible thinking approach. *Knowledge Management & E-Learning*, 17(4), 538–556. <https://doi.org/10.34105/j.kmel.2025.17.025>
- Cook, V., & Singleton, D. (2019). *Al-Usus al-nafsīyah fī ta'lim al-lughāt al-ajnabīyah* [Psychological foundations in foreign language teaching] (M. A. Al-Khuli, Trans.). Dar al-Nahda.
- Council of Europe. (2001). *Common European framework of reference for languages: Learning, teaching, assessment*. Cambridge University Press.
- Evanick, J. (2025a). AI as a co-educator: Crafting the perfect balance in modern courses. In *The Learning Ideas Conference* (pp. 143–155). Springer Nature Switzerland. https://doi.org/10.1007/978-3-032-09905-1_12
- Evanick, J. (2025b). Building the future: Ongoing lessons from developing a faculty center for AI innovation in education. In *The Learning Ideas Conference* (pp. 157–170). Springer Nature Switzerland. https://doi.org/10.1007/978-3-032-09905-1_13
- Faqeeh, M. H. (2024). The students' awareness degree of the effectiveness of artificial intelligence applications in learning the Arabic language. *Research Journal in Advanced Humanities*, 5(4), 703–719. <https://doi.org/10.58256/tzjb9156>
- Hanandeh, A., et al. (2024). Artificial intelligence in Arabic linguistic landscape: Opportunities, challenges, and future directions. *TEM Journal*, 13(4), 3137–3145. <https://doi.org/10.18421/TEM134-48>
- Hasani, A. (2021). Conceptual frameworks on how to teach STEM concepts in Bahasa Indonesia subject as integrated learning in grades 1–3 at elementary school in the Curriculum 2013 to contribute to sustainability education. *Sustainability*, 13(1), 173. <https://doi.org/10.3390/su13010173>
- Hijriyah, U. (2025). How effective is SUNO.AI in enhancing Arabic listening skills? An evaluation of AI-based personalized learning. *International Journal of Information and Education Technology*, 15(2), 391–407. <https://doi.org/10.18178/ijiet.2025.15.2.2251>
- Ibn Manzur, M. M. A. (1414 AH). *Lisān al- 'Arab* [The tongue of the Arabs] (3rd ed.). Dar Sadir.
- Jawabreh, M. (2025). Efficiency of artificial intelligence in answering questions of Palestinian general secondary education exam (Tawjihi) in Arabic curricula: Case of ChatGPT and Gemini. *An-Najah University Journal for Research B: Humanities*, 39(8), 551–570. <https://doi.org/10.35552/0247.39.8.2442>
- Kim, D. H. (2023). AI curriculum design for Korea K-12 AI education through analyzing AI education curriculum. *International Journal of Recent Technology and Engineering (IJRTE)*, 12(3), 72–81.
- Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. *RELC Journal*, 54(2), 537–550. <https://doi.org/10.1177/00336882231162868>
- Mar'i, T. A., & Al-Hila, M. M. (2000). *Al-Manāhij al-tarbawīyah al-ḥadīthah: Maḥmūhā wa- 'anāsiruhā wa-ususuhā wa- 'amalīyātuhā* [Modern educational curricula: Concept, elements, foundations, and processes]. Dar al-Masira.
- Melo-López, V. A., et al. (2025). The impact of artificial intelligence on inclusive education: A systematic review. *Education Sciences*, 15(5), 539. <https://doi.org/10.3390/educsci15050539>
- Ministry of Education. (2011). *Al-Wathīqah al-waṭanīyah li-māddat al-lughah al- 'Arabīyah lil-nāṭiqīn bi-ghayrihā* [The national document for Arabic as a subject for non-native speakers]. Curriculum and Materials Department, United Arab Emirates.

- Moustafa, A. H. A. (2026). Generative AI for learning and teaching Arabic: Opportunities, challenges, and ethical considerations. *IEEE Access*, 14, 7379–7395. <https://doi.org/10.1109/ACCESS.2026.3651864>
- Munajat, F., & Abidin, M. I. Z. (2025). Best practices for teaching speaking skills based on management aspects and ACTFL proficiency levels at STIBA Ar Raayah. *Alsina : Journal of Arabic Studies*, 7(2), 257–284. <https://doi.org/10.21580/alsina.7.2.28197>
- Putra, M. F. B., Salsabila, O. S., Siregar, S. R., Akbar, I. A., & Syaifiah, I. (2026). Augmented reality and virtual reality in Arabic speaking skills instruction: A systematic review of pedagogical contributions. *Alsina : Journal of Arabic Studies*, 8(1), 131–164. <https://doi.org/10.21580/alsina.8.1.27660>
- Richards, J. C. (2012). *Taṭwīr manāhij ta'lim al-lughah* [Developing language teaching curricula] (N. Ben Ghali & S. Al-Shuwayrikh, Trans.). King Saud University.
- Richards, J. C., & Rodgers, T. S. (1986). *Approaches and methods in language teaching: A description and analysis*. Cambridge University Press.
- Rouabhi, S. (2024). Multimodal classification of the Arabic alphabet: An artificial intelligence approach for handwriting, sign language, and Braille. In *Next generation AI methodologies in education* (pp. 255–284). <https://doi.org/10.4018/979-8-3693-7220-3.ch010>
- Sa'idah, M. A. (2024). Enhancing Arabic language teaching through artificial intelligence: Assessing effectiveness and educational implications. In *2024 3rd International Conference on Creative Communication and Innovative Technology (ICCIT 2024)*. <https://doi.org/10.1109/ICCIT62134.2024.10701089>
- Sapawi, M. S. M., et al. (2025). Integrating technology into the Arabic language curriculum: A systematic review of trends, strategies and cultural dimensions. *Social Sciences and Humanities Open*, 12, 101974. <https://doi.org/10.1016/j.ssaho.2025.101974>
- Sarrazy, B. (2002). Pédagogie et enseignement : pour une clarification du débat dans la communauté des sciences de l'éducation [Pedagogy and teaching: Toward a clarification of the debate in the educational sciences community]. In J. F. Marcel (Ed.), *Les sciences de l'éducation : des recherches, une discipline ?* [Educational sciences: Research, a discipline?] (pp. 131–154). L'Harmattan.
- Sismat, A. (2025). Exploring the impact of ChatGPT on non-native learners of Arabic language: Challenges and opportunities. *Studies in Computational Intelligence*, 1228, 281–305.
- Taima, R. A. (2004). *Al-Mahārāt al-lughawīyah: Mustawayātuhā, tadrīsuḥā, ṣu'ūbātuhā* [Language skills: Their levels, teaching, and difficulty]. Dar al-Fikr al-Arabi.
- Taima, R. A. (2006). *Al-Marji' fī ta'lim al-lughah al-'Arabīyah lil-nāṭiqīn bi-ghayrihā* [The reference in teaching Arabic to non-native speakers]. Umm Al-Qura University.
- UNESCO. (2023). *Guidance for generative AI in education and research*. <https://unesdoc.unesco.org/ark:/48223/pf0000386693>
- UNESCO. (2025). *AI competency framework for students and teachers: Guidance on AI in schools*.
- Usof, A. (2025). Employing artificial intelligence in teaching Arabic to non-native speakers: An analytical study on undergraduate students at Sultan Idris University in Malaysia, Duolingo application as a model. *Dragoman*, 17, 177–187. <https://doi.org/10.63132/ati.2025.employ.64677989>
- Yan, D. (2024). Reconceptualizing self-directed learning in the era of generative AI: An exploratory analysis of language learning. *IEEE Transactions on Learning Technologies*, 17, 1515–1529. <https://doi.org/10.1109/TLT.2024.3386098>