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DEVELOPMENT OF THE AN-NASR MOBILE APPLICATION TO ENHANCE INDEPENDENT LEARNING SKILLS IN ARABIC LANGUAGE INSTRUCTION

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ABSTRACT

This study addresses a gap in curriculum-aligned interactive mobile media for high school Arabic learning. Although smartphones are common, Arabic instruction remains dominated by lectures and workbooks, limiting multimodal practice and formative feedback. This research develops and validates the An-Nasr mobile learning application through the first three ADDIE stages: analysis, design, and development. Interviews with 15 Class X students and one Arabic teacher revealed that 53.3% (n=8) identified qawāʿid (grammar) as the primary learning obstacle, followed by meaning comprehension (26.7%, n=4) and vocabulary (20%, n=3), reaffirming grammar complexity as a structural barrier for non-Semitic language learners. A technology-adoption paradox emerged: 53.3% had used Duolingo and 33.3% used translation apps, yet 46.7% (n=7) never used smartphones for Arabic study, while 40% ranked mobile learning as their preferred format. This reflects systemic inhibition caused by a lack of curriculum-aligned apps and limited teacher confidence in integrating smartphone-mediated learning. The prototype was developed using PowerPoint, iSpring Suite, and Web 2 APK Builder, embedding structured modules, transliteration, native-speaker audio, annotated visuals, animations, gamified quizzes, real-time feedback, adaptive learning paths, and autosave progress tracking. Expert validation indicated high feasibility (subject-matter: 92%; media: 91%). Field trials showed strong teacher acceptance (91%) and acceptable student feasibility (77%), yielding an overall feasibility score of 87.75%, confirming prototype readiness for broader implementation. The findings reinforce that curriculum alignment, multimodal scaffolding, and meaningful formative interactivity, rather than device availability alone, determine adoption, autonomy, and learner comprehensibility in secondary Arabic digital learning environments.

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INTRODUCTION

The digital transformation of education has fundamentally changed pedagogical approaches worldwide, creating both challenges and opportunities for language learning (Hennelly & Ctori, 2023). In Indonesian Islamic education, the teaching of Arabic faces certain complexities because it serves dual purposes: facilitating religious understanding and developing communicative competence. However, traditional pedagogical approaches often fail to engage digital-native students who expect an interactive learning experience mediated by technology.

Mobile-assisted language learning (MALL) has emerged as a promising pedagogical approach, offering flexibility, personalization, and multimodal content delivery that aligns with the preferences of contemporary learners (Widiananda et al., 2023). Research shows that mobile apps can significantly improve language acquisition by increasing engagement, providing direct feedback, and offering contextual learning opportunities (Widiananda et al., 2023). The principles of gamification, when integrated into educational technology, have shown a positive effect on motivation and learning outcomes by incorporating game design elements such as points, levels, and direct rewards (Seventilofa, 2024).

Despite extensive international research on digital language learning tools, there is a significant gap in contextually appropriate Arabic language learning applications for Indonesian Islamic high schools (Amadi & Sholikha, 2023). Most existing studies focus on the application of common language learning or Arabic language learning across different cultural contexts, with limited attention to the specific needs of Indonesian students with diverse educational backgrounds and curriculum requirements (Haq et al., 2024).

Early observations and interviews in Islamic high schools reveal several critical problems: (1) learning media is limited to worksheets and photocopying; (2) the absence of a visualization tool for abstract Arabic grammatical concepts; (3) the unavailability of mobile applications that are aligned with the local curriculum and institutional context; (4) teacher-centered teaching that results in passive learning; (5) low motivation due to monotonous teaching methods; and (6) lack of gamification elements in the learning process.

These findings reflect a broader challenge in Arabic language education in Indonesia, where students often struggle because conventional pedagogical approaches fail to leverage available technologies. While students have smartphones and schools allow their use in education, these devices remain underutilized for Arabic language learning, creating a paradox between the availability of technology and its pedagogical applications.

This study aims to: (1) analyze the needs of learning media for Arabic language teaching through a systematic needs assessment; (2) designing and develop a mobile application (An-Nasr) based on the ADDIE model, combining the principles of multimedia and interactive gamification; and (3) evaluate the quality of the application through expert validation and user response assessment.

Theoretically and practically, this research makes a significant contribution to the MALL literature through three main aspects. First, it provides empirical evidence of mobile app development tailored to specific cultural and curricular contexts in Islamic education. Second, it demonstrates the systematic application of the ADDIE model to create interactive learning media that address identified pedagogical gaps. Third, it offers insights into students' preferences and challenges in learning Arabic, which can inform future developments in educational technology in this context.

The study expands on previous research on digital Arabic learning media by integrating a comprehensive needs analysis, theoretical grounding in MALL and gamification principles, and a rigorous validation process (Laiya, 2025). In contrast to previous research that often focused only on product development, this study emphasizes theoretical foundations and systematic development processes that ensure pedagogical effectiveness and contextual suitability.

METHOD

This study employed a Research and Development (R&D) design guided by the ADDIE model, selected for its structured and iterative framework that supports systematic prototype refinement and expert validation before field deployment (Sanchez-García et al., 2023). Consistent with standard practice in educational technology R&D, the present research was intentionally scoped to the first three stages: Analysis, Design, and Development to produce a validated prototype for future full-cycle implementation and effectiveness testing (Ramli et al., 2024; Ramli et al., 2024). This delimitation reflects methodological pragmatism rather than reduced rigor, ensuring strong foundational validity for subsequent research phases.

The study was conducted in Islamic senior high schools implementing the Independent Curriculum for Arabic instruction, a context characterized by heterogeneous learner baselines. Participants included 15 Class X students and one Arabic teacher in the needs analysis phase, followed by two expert validators, a subject-matter specialist in Arabic education (M.Ag) and a media expert in educational technology (Ph.D. in Computer Science), during prototype validation. The development trial involved 12 Class X students with Android devices capable of installing the application, along with one Arabic teacher.

Needs analysis data were collected through semi-structured interviews in two formats: (1) individual interviews with the Arabic teacher addressing curriculum enactment, instructional strategies, resource availability, and learning barriers; and (2) student Focus Group Discussions (FGDs) organized into three groups (n=5 each) to elicit technology use habits, learning preferences, and desired digital learning affordances. Interview protocols were theoretically anchored in the Technology Acceptance Model (TAM) and language-learning needs frameworks to ensure the structured elicitation of pedagogical, technological, and contextual design determinants (Farros et al., 2022; Farros et al., 2022). All sessions were audio-recorded with consent, transcribed verbatim, and analyzed using thematic analysis to extract recurring design needs (Iyamu & Mutudi, 2022).

Prototype validity was established via expert questionnaires, each comprising 15 items assessed on a 5-point Likert scale (Oducado, 2021; Oducado, 2021). The material validation instrument examined learning design, material scope, and linguistic appropriateness (5 items per dimension), while the media validation instrument evaluated interface appearance, technical programming, and interactivity quality (5 items per dimension), reflecting multidimensional quality assurance standards in digital learning development (Oducado, 2021).

Table 1

Score	Criterion
5	Highly Worth It
4	Proper
3	Quite Decent
2	Less Worthy
1	Not Eligible

The validation instrument was developed using established quality criteria for educational media and reviewed for content validity by the research supervisor before administration. To ensure rigorous appraisal, validators were provided with the application prototype, supporting documentation, and an evaluation rubric two weeks before the scheduled validation session, enabling sufficient time for systematic review and rubric-based scoring.

Feasibility and user-response evaluations were collected using structured questionnaires tailored to teacher and student roles. The teacher-response instrument comprised 17 items across five dimensions: ease of use (3 items), content quality (3 items), interactivity (4 items), design (3 items), and language suitability (2 items). The student-response instrument also contained 17 items covering content quality (4), interactivity (3), usability (3), language (2), and feedback clarity (3). Both instruments employed a 5-point Likert scale, consistent with the validation rubric, to maintain scoring coherence across evaluation phases.

Field trials were conducted for one week, during which participants used the application independently. Post-trial data were collected via Google Forms, yielding a 100% completion rate among teachers and students (n=12), all of whom met device-compatibility requirements. The full completion rate confirms strong data sufficiency for feasibility estimation. Eligibility scores were calculated using a percentage-based feasibility formula (Saiful & Yusoff, 2019).

$$P = (\Sigma x / \Sigma xi) \times 100\%$$

P = percentage of eligibility,
Left = the number of scores obtained from respondents, and
Sxi = the ideal maximum score amount.

With the following eligibility interpretation categories:

Table 2

Score	Criterion
81-100%	Highly Worth It
61-80%	Proper
41-60%	Quite Decent
21-40%	Less Worthy
0-20%	Not Eligible

Data analysis in this study was carried out using two approaches: quantitative and qualitative, to obtain a comprehensive understanding of the feasibility of the developed application. Quantitative analysis is applied to validation data and user responses using descriptive statistics, where the percentage of feasibility is calculated with the formula:

$$\text{Eligibility Percentage} = (\text{Score Obtained} / \text{Maximum Score}) \times 100\%$$

With the interpretation criteria following the set threshold:

Table 3

Score	Criterion
81-100%	Highly Worth It
61-80%	Proper
41-60%	Quite Decent
21-40%	Less Worthy
0-20%	Not Eligible

Qualitative analysis of interview data was conducted using thematic analysis within a six-phase framework: initial coding, theme identification, review, definition, and report production. Open-ended responses from validation and trial questionnaires were also coded and categorized to capture improvement suggestions and potential implementation challenges. The study obtained official approval from the school and applied strict ethical protocols, including informed consent from all participants and parental consent for students under 18. Anonymity and confidentiality were maintained, and students were informed that participation was voluntary and would not affect their academic performance or achievement.

RESULT AND DISCUSSION

Result

Analysis of Arabic Learning Media Needs

The needs analysis phase yielded critical empirical insights into students' linguistic challenges, patterns of technology engagement, and expectations for the affordances of digital Arabic learning, forming the basis for evidence-driven design decisions. Data collected from 15 Class X students and one Arabic teacher served as triangulated input for formulating pedagogical, technological, and user-experience requirements in the development of the *An-Nasr* mobile learning application. The analysis identified that grammar comprehension constituted the most significant learning barrier, with 53.3% (n=8) of students reporting *qawāʿid* (Arabic grammar) as their primary difficulty, followed by meaning comprehension (26.7%, n=4) and vocabulary acquisition (20%, n=3). This distribution corroborates contemporary findings that Arabic morphosyntactic complexity poses a persistent acquisition obstacle, particularly for learners unfamiliar with Semitic linguistic structures (Muna et al., 2024). The predominance of grammatical challenges signals a need for explicit rule presentation coupled with contextualized and interactive practice, directly informing the

prioritization of the *qawāʿid* explanatory module and structured in-app exercises in *An-Nasr* (Allen, 2019).

A notable paradox emerged in students' engagement with technology. Despite 53.3% (n=8) reporting prior use of Duolingo and 33.3% (n=5) having relied on translation applications for Arabic learning, 46.7% (n=7) indicated never using smartphones for Arabic study, with 40% (n=6) using them only rarely. Interestingly, mobile learning was simultaneously ranked as the most preferred learning format (40%, n=6), surpassing PowerPoint (26.7%, n=4) and worksheets (13.3%, n=2). This divergence reflects systemic inhibition rather than motivational deficit. Thematic interview analysis revealed three constraining factors: (1) lack of curriculum-aligned Arabic learning applications; (2) teachers' uncertainty in integrating smartphone-mediated learning activities; and (3) students' perceptions that existing applications fail to meet their curricular and linguistic needs. These findings extend the MALL implementation discourse by reaffirming that device access alone does not guarantee meaningful technology uptake without pedagogically aligned applications (Alisoy & Sadiqzade, 2024).

Learners articulated strong expectations for interactive and formative learning affordances. Desired features included quizzes (33.3%, n=5), translation tools (26.7%, n=4), grammar explanations (26.7%, n=4), and audio support (13.3%, n=2), reflecting students' awareness of the formative role of assessment and feedback in reinforcing language knowledge (Rahmawati et al., 2023; Rahmawati et al., 2023). All respondents (100%) emphasized the importance of interactivity, with 60% categorizing it as "necessary" and 40% as "very necessary," aligning with constructivist assumptions that digital learning environments should enable active knowledge construction through meaningful interaction (Raturi, 2023; Raturi, 2023). Social learning preferences also favored collaboration, with 60% (n=9) selecting group learning, 26.7% (n=4) paired learning, and only 13.3% (n=2) independent learning, consistent with evidence demonstrating the effectiveness of collaborative learning in strengthening communicative competence in second language contexts (Rahayu et al., 2024).

Students' topic preferences further underscored the role of relevance and interest-driven learning. Hobbies-related content was identified as most engaging (53.3%, n=8), followed by professions (26.7%, n=4), sports (13.3%, n=2), and daily activities (6.7%, n=1), reinforcing the principle that personally meaningful content enhances learner motivation and facilitates stronger learning outcomes in digital language environments (Johansen et al., 2023; Johansen et al., 2023). Teacher interviews revealed complementary instructional gaps, including heavy reliance on lecture methods and curriculum workbooks, limited capacity for differentiated instruction in mixed-ability classrooms, and persistent difficulty in teaching abstract grammar without visualization support. However, teachers also recognized students' informal smartphone use as latent pedagogical potential, expressing interest in interactive media that can provide real-time feedback, multimodal explanations, and opportunities for independent practice beyond classroom hours, particularly to mitigate time limitations and reduce correction workload (Aflah & Fitriah, 2025; Aflah & Fitriah, 2025).

The synthesis of findings resulted in five non-negotiable design imperatives for *An-Nasr*: (1) grammar-focused content with multimodal rule representation; (2) interactive assessments with live feedback and gamification support; (3) multimodal content integration (text, audio, visuals, animations); (4) curriculum-aligned, interest-driven topics; and (5)

intuitive interface design accommodating varied levels of technology literacy. Collectively, these requirements ensure that application development decisions are anchored in empirically verified needs rather than in assumed preferences, while aligning with theoretical principles of MALL and gamified language-learning frameworks (Alisoy & Sadiqzade, 2024).

An-Nasr Application Design and Development Process

The development process follows the Analysis, Design, and Development phase of the ADDIE model, with each stage systematically built on an empirical foundation established through needs analysis.

Stages of Analysis

Beyond learner needs, the analysis phase incorporated two contextual determinants of development: curriculum specifications and learner background heterogeneity. A curriculum analysis of independent curriculum frameworks indicates a strong orientation toward student-centered instruction, cultivation of 21st-century skills, and flexible learning trajectories (Sebastian et al., 2025). The competency-based curriculum for Class X defines four core *maharah* (language skills): *istimāʿ* (listening), *kalām* (speaking), *qirāʾah* (reading), and *kitābah* (writing) while also delineating essential grammatical targets (*fiʿl muḍāriʿ*, *ism faʿil*, etc.) and thematic units (hobbies, professions). Teachers reported supplementing official workbooks with Ministry of Religious Affairs materials to mitigate perceived content limitations, underscoring the pedagogical value of a curriculum-aligned digital application in reducing preparation load and strengthening instructional coherence. Consequently, these findings established content-development priorities that emphasize comprehensive competency coverage and grammatical rigor as foundational design principles.

Student background analysis revealed pronounced heterogeneity in prior Arabic literacy and linguistic preparedness. MTs graduates possess foundational competencies in *hijāʾiyyah* recognition, basic lexicon, and introductory grammar, enabling them to engage with intermediate content. Conversely, many SMP graduates demonstrate limited fluency in Arabic script, with some struggling to decode Arabic text. This disparity necessitates multi-level entry points and differentiated learning pathways. The proposed design solution integrates: (1) a foundational review module (*hijāʾiyyah* and basic vocabulary), (2) adaptive learning routes allowing users to bypass mastered content, (3) systematic scaffolding progressing from concrete exemplars to abstract *qawāʿid*, and (4) embedded linguistic supports (translation tools, glossary). This approach reflects sociocultural learning principles, particularly the Zone of Proximal Development (ZPD), which posits that effective digital language instruction must bridge disparate prior knowledge through structured scaffolding toward shared competency outcomes (Zhang et al., 2018). The findings affirm that equitable achievement of curricular objectives in heterogeneous classrooms requires technology designs that enable adaptive progression while preserving unified learning targets.

Design Stage

The design phase translates insights from the needs analysis into concrete development specifications through a set of interconnected activities that guide the systematic construction of the application. Content preparation is based on three primary sources: an official independent curriculum workbook that provides core material aligned with learning

objectives; Arabic textbooks published by the Ministry of Religious Affairs that offer complementary explanations and examples; and authentic materials, such as simple texts on hobbies and professions, to enhance relevance and learner engagement. Grammatical explanations are structured according to explicit instruction principles, including rule presentation, illustrative examples, guided practice, and independent application (Kizi, 2025).

Each grammar topic includes clear definitions using appropriate linguistic terminology, structural patterns with color-coded morphological components, contextualized example sentences, and progressively sequenced practice exercises that move from introduction to production tasks. Vocabulary instruction is thematically organized around hobbies and professions identified in the needs analysis, with each unit presenting 15–20 target items, accompanied by Arabic text and transliteration, Indonesian translations, native-speaker audio recordings of pronunciation, contextual usage examples, and visual representations.

Assessment development is designed in accordance with Bloom's taxonomy by incorporating quiz items across multiple cognitive levels, including remembering through vocabulary recognition, understanding via translation tasks, applying grammatical patterns, and analyzing errors. Each quiz consists of 10–15 items with clear instructions, randomized answer options, real-time feedback displaying correct answers with brief explanations, and score reporting that categorizes achievement levels as excellent, good, fair, or needs improvement. Gamification elements are strategically integrated through a points system that rewards completion and accuracy, achievement badges for milestones such as module completion and perfect quiz scores, and visual progress-tracking features. These elements align with self-determination theory by supporting learner autonomy through the choice of learning paths, competence through explicit performance feedback, and connectedness through shareable achievements (Yadav, Nghiem, & Yadav, 2025).

Multimedia asset collection is conducted with careful attention to supporting multimodal learning. Visual elements, including images and animations, are sourced from copyright-free repositories such as Pixabay and Pexels or custom-designed using graphic design software. Audio components include native Arabic speaker recordings for vocabulary and text pronunciation, neutral-paced narration for instructional explanations, and engaging sound effects for gamification features such as achievement notifications and correct-answer feedback. The selection and integration of multimedia elements follow principles of cognitive load theory, ensuring that visual and auditory resources reinforce rather than distract from learning objectives. Decorative graphics are intentionally minimized, while explanatory visuals such as grammatical diagrams and annotated sentence examples are prioritized to support comprehension.

The application's overall navigation structure is planned through detailed flowcharts and storyboards that map the user experience from the entry point to all functional components. These flowcharts define the opening screen, main menu options including learning materials, quizzes, user guides, and settings, as well as module pathways, quiz sequences, and feedback screens. By establishing a clear, logical information architecture, flowcharts help prevent user disorientation and ensure smooth navigation throughout the application (Davis, 2019). A visual flowchart illustrates the complete design framework of the An-Nasr Arabic learning application.

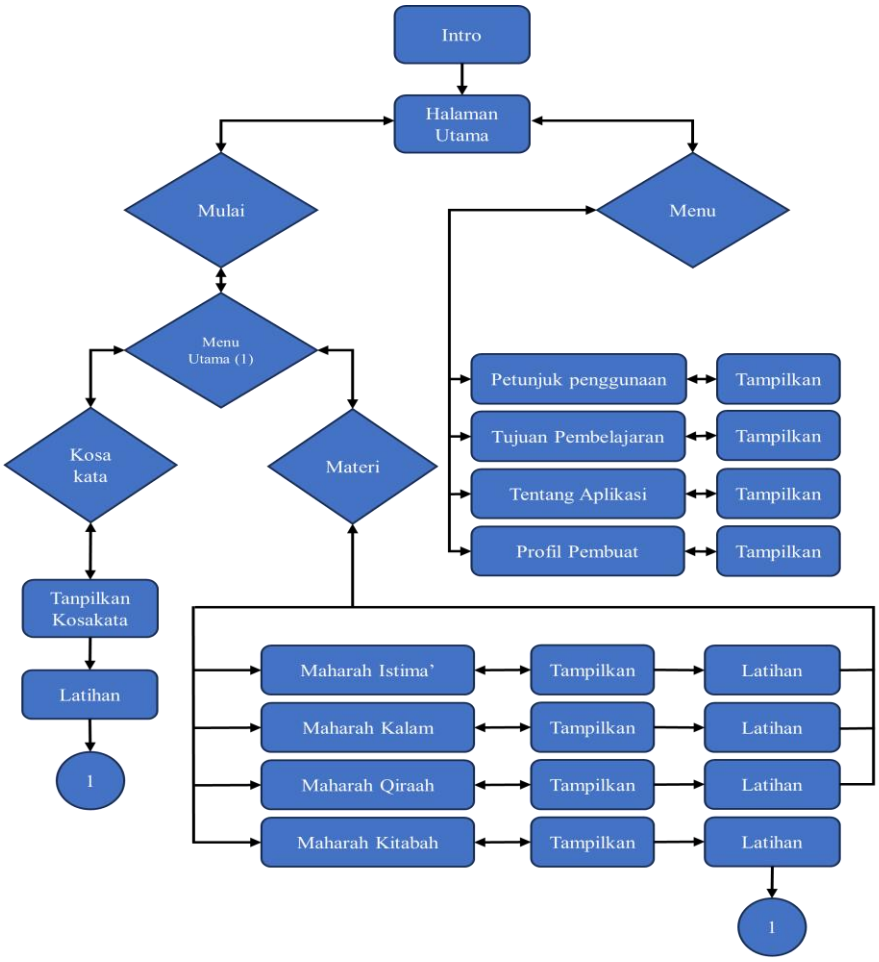

Figure 1 Flowchart

After completing the creation *flowchart* or a flowchart outlining the application's working process, the next step is to compile *a storyboard. Storyboard* provides screen-by-screen visual specifications, including: layout composition (content placement, navigation buttons), color scheme (consistent with Islamic educational aesthetics while ensuring readability), typography (Arabic fonts optimized for mobile displays, appropriate sizes for different screen sizes), and interaction points (buttons, scrollable content, audio playback controls)(Purwanti, 2023).

This comprehensive design documentation serves a dual purpose: to provide clear development guidelines and allow for supervisor review before beginning the resource-intensive development phase (Kumar & Gouri, 2023). The systematic planning approach reflects instructional design best practices that emphasize thoughtful preparation rather than reactive improvisation (Morrison et al., 2019).

Development Stage

The development stage transforms the design specification into a functional mobile app through a multi-phase technical process:

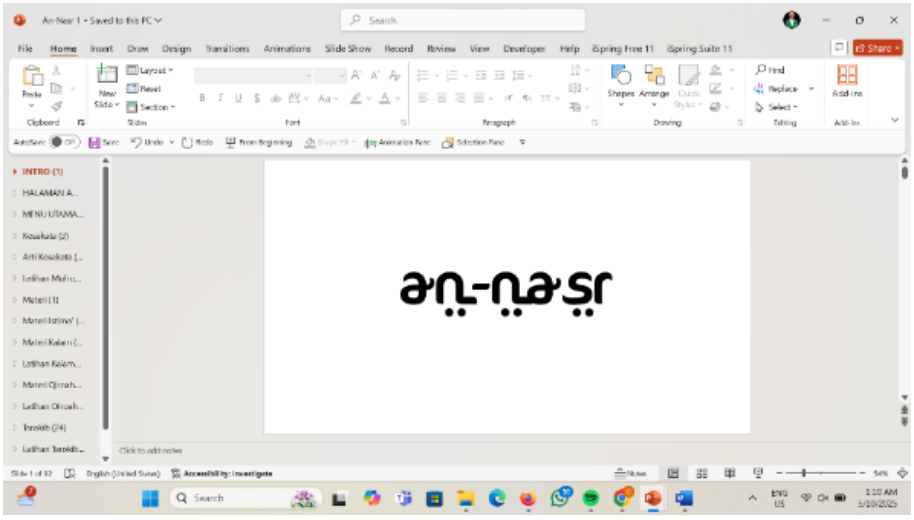

Figure 2 Microsoft PowerPoint View

The initial content assembly uses the familiar Microsoft PowerPoint interface, allowing for efficient slide creation and organization. This section features content organized hierarchically: main modules (grammar topics), sub-sections (explanations, examples, exercises), and individual learning units. Each slide is combined: a background design that establishes a visual identity, text content in Arabic and Indonesian formats that are appropriate, a static image to support the explanation, and placeholder elements for further refinement.

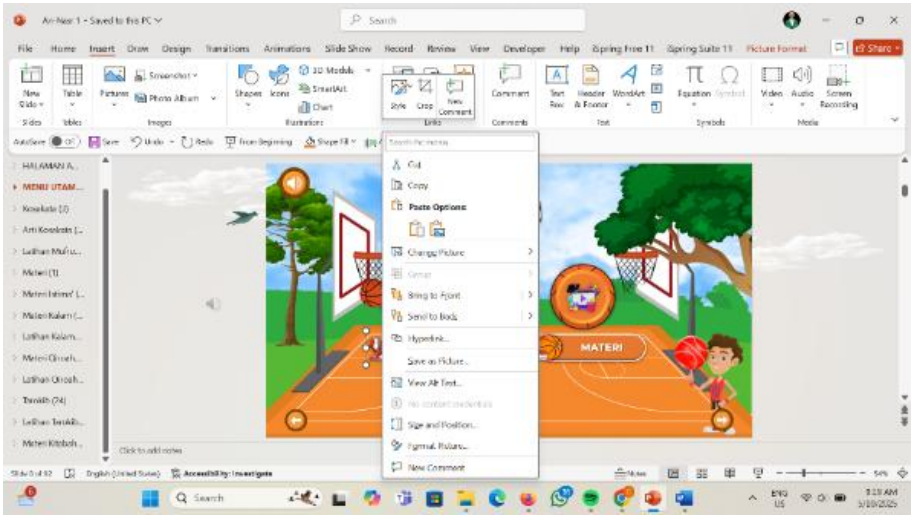

Figure 3 Hyperlink Features

The navigation buttons are implemented using PowerPoint's hyperlink functionality, allowing forward/backward movement between slides, returning to the main menu, controlling audio playback, and accessing translation overlays. This approach provides basic interactivity within PowerPoint's native capabilities before integrating advanced features.

The iSpring Suite integration transforms static presentations into interactive multimedia experiences. Significant improvements include: iSpring Quiz Maker enables advanced

scoring features not available in basic PowerPoint, such as random question selection from a bank of items, branching logic (performance-based adaptive question sequence), detailed answer feedback with explanations, timed assessment tracking of completion speed, and comprehensive outcome reporting with performance analytics.

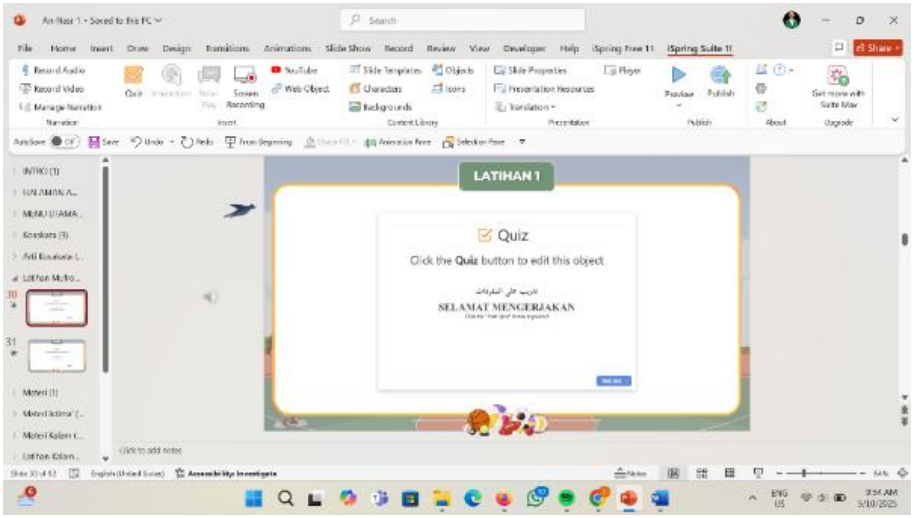

Figure 4 iSpring Suite Integration

Quiz questions are configured with multiple-choice formats for introductory tasks, blank-fill exercises for grammar, matching activities that connect vocabulary to definitions/images, and true/false items for comprehension checks. Each question includes a feedback message: a congratulatory text with a brief explanation for the correct response, constructive guidance that identifies misunderstandings for the wrong response.

Figure 5 Multimedia Synchronization

Audio narration is synchronized with the content on the screen using iSpring's timeline editor, ensuring that: vocabulary pronunciation plays when items appear, grammar explanations feature voiceovers coordinated with highlighted text, and sentence examples include audio playback with text that highlights following the rhythm of speech.

Comprehensive testing occurs before finalization: all navigation paths are tracked to identify dead ends or circular loops, audio synchronization is verified across slides, quiz

functionality is tested for accurate scoring and appropriate feedback delivery, and display consistency is checked across various screen resolutions in PowerPoint presentation mode.

Identified issues are documented and fixed regularly. For example, the initial audio playback sometimes interferes with navigation, solved by adjusting the trigger settings. Quiz feedback initially lacked an adequate explanation; this was addressed by expanding the response message. These iterative refinements reflect agile development principles that emphasize continuous testing and improvement (Beck et al., 2001).

The completed PowerPoint presentation is published to HTML5 format using the iSpring converter, generating: a standalone HTML5 package containing all content, assets, and interactive elements; optimized media files (compressed audio and responsive images); and JavaScript code that enables quizzes and navigation functionality in web browsers. Publication settings are configured for balancing medium-quality file sizes with visual precision, customizing the player interface (Arabic-compliant color scheme, navigation controls), and mobile optimization that ensures responsive layout adaptation across different screen sizes.

The HTML5 package is converted to the Android APK format using the Web 2 APK Builder, which enables installation on Android devices without an internet connection, integration with device features (e.g., local storage for progress tracking), and distribution via standard APK installation procedures. The conversion process involved: selecting the "Local HTML Website" option as the input of the HTML5 folder, configuring the app's metadata (name: "An-Nasr", version: 1.0, design icons displaying Arabic calligraphy), setting the display properties (full-screen orientation, corresponding screen size), and building the APK file through the platform's auto-compilation process.

The resulting APK file (approximately 45 MB) is tested on various Android devices (versions 8.0-13.0, different manufacturers) to ensure consistent compatibility and functionality. Testing revealed no significant device-specific issues, confirming that the Web 2 APK Builder's compatibility layer successfully manages platform variation.

Repeated validation and refinement

Important feedback informing improvements before user trials:

Subject Matter Expert Validation**:** Subject matter experts (M.Ag in Arabic Language Education) evaluate content in three dimensions, providing quantitative ratings and qualitative feedback:

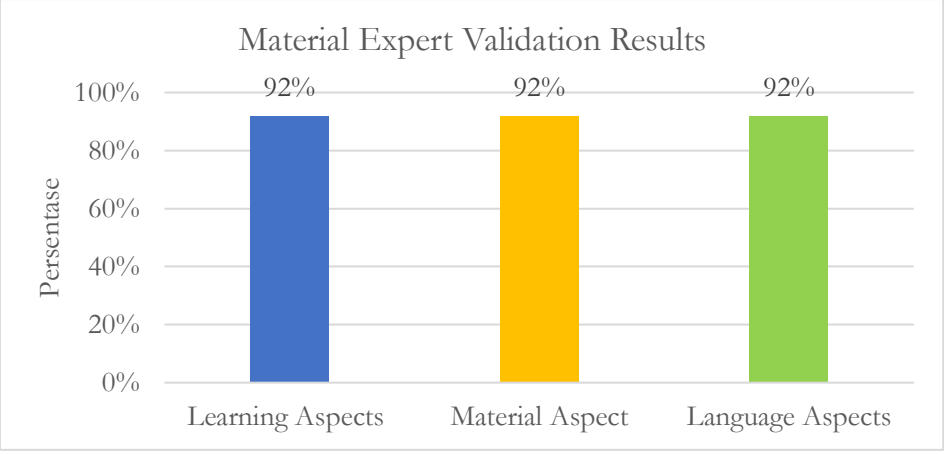

Figure 6 Bar Diagram of Material Expert Validation Results

Learning Aspects (92% - Very Feasible): Strengths include effective technology integration, clear instructions for use, and versatility across learning contexts. One of the weaknesses identified is limited support for self-paced learning, as the app's structured pathways offer inadequate opportunities for learner-directed exploration. Recommendation: Add an optional "challenge mode" with open-ended tasks that encourage the use of creative language outside of the specified exercise.

Material Aspect (92% - Very Feasible): Alignment with the curriculum objectives and clear presentation are highly rated. Concerns arise regarding: (a) material adequacy – some grammar topics receive minimal coverage relative to their complexity; (b) Suitability of practical questions – some items assess memorization rather than applied comprehension. Specific feedback led to the revisions detailed in Table 11 of the original document.

Language Aspects (92% – Very Feasible): Language use and vocabulary are appropriate, but some explanations exceed the student's comprehension level, using excessive linguistic terminology without adequate scaffolding. Recommendation: Simplify metalinguistic descriptions and provide concrete examples before introducing technical terms.

Critical revisions based on subject matter expert feedback include: Corrected a vocabulary practice question from "أَنْظُرْ إِلَى الصُّوْرَةِ" (View image) to "أُنْظُرْ إِلَى هَذِهِ الصُّوْرَةِ مَاذَا تَقُلُ بِالْعَرَبِيَةِ !" (See this picture! What do you say in Arabic?); Dividing long istima' (listening) texts into three shorter segments with appropriate comprehension questions reduces cognitive load and allows for focused listening exercises.

Media experts (Dr. in Computer Science, specializing in Educational Technology) assess the technical and design dimensions:

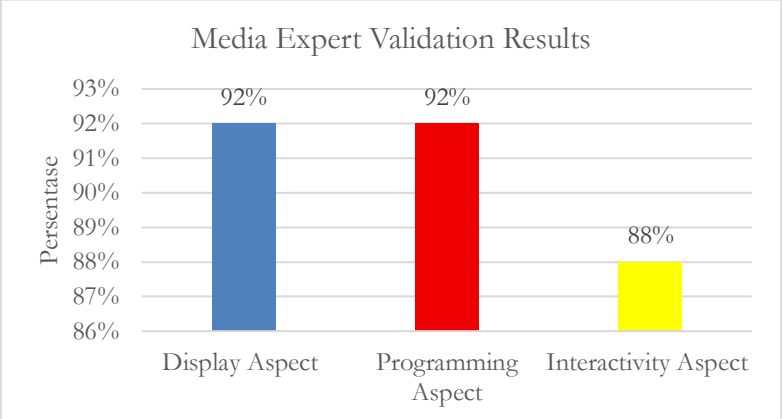

Figure 7 Bar Diagram of Media Expert Validation Results

Display Aspect (92% - Very Feasible): Interface clarity and visual aesthetics meet high standards, with a practical layout that supports intuitive content access. Minor concerns include: (a) design consistency – some navigation icons lack visual coherence; (b) text readability – font size sometimes drops below the optimal range for mobile display (especially for Arabic diacritic signs).

Programming Aspect (92% - Very Decent): The app's responsiveness and compatibility across all Android versions are excellent. Navigation efficiency generally works well, though some multi-step processes (e.g., accessing certain sections of the quiz) could be simplified. The app's

reliability shows one minor bug: progress tracking sometimes fails to save between sessions, which is addressed by applying more frequent autosave triggers.

Interactivity Aspect (88% - Very Feasible): The use of interactive multimedia and the suitability of feedback are strong, but gamification features can be improved. Specific recommendations include: expanding the variety of achievement badges, adding visual progress indicators in the main menu, and implementing social features (an optional leaderboard for willing participants).

The leading media expert's recommendation – increasing the quiz text size from 36pt to 40pt – was immediately implemented, significantly improving readability on a standard smartphone screen.

Figure 8 Before Revision

Figure 9 After Revision

Evaluate Application Quality Through User Trials

After expert validation and revision, the An-Nasr app underwent field trials with Arabic teachers and Class X students to assess its real-world usability and perceived effectiveness.

Teacher's Response

The evaluation of participating Arabic teachers showed a very high level of eligibility, with an overall 91% in the "Very Feasible" category, providing valuable insights into the pedagogical utility of the application and the potential for practical integration in the context of Arabic language learning in an educational setting. The results of the teacher's response questionnaire are shown in the following diagram.

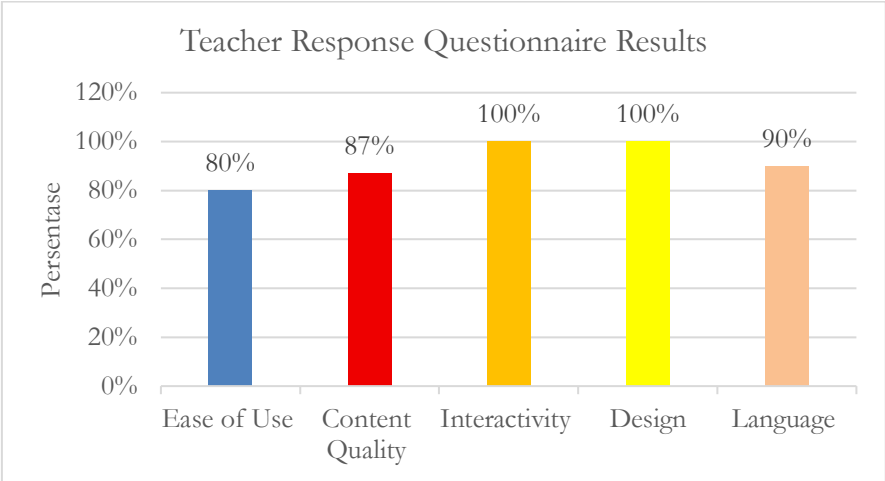

Figure 10 Bar Diagram of Teacher Response Questionnaire Results

Teachers perceived the application as accessible and operationally feasible, reflected in an ease-of-use eligibility score of 80%, though navigation clarity requires refinement.

Teachers recommended replacing text-dominant instructions with multimodal onboarding support, such as video tutorials or interactive guides, to reduce ambiguity. Usability friction was also reported in menu hierarchies that demand multiple taps to reach high-frequency features (e.g., quiz results, learning progress), a known limitation when functionality outweighs interface efficiency. This aligns with evidence that even feature-rich learning applications risk low adoption if affordances are not easily retrievable (Milla et al., 2024).

The application achieved an excellent content-quality rating (87%), confirming strong curriculum alignment and instructional clarity. Teachers highlighted three core strengths: (1) comprehensive coverage of competency targets from the independent curriculum, (2) structured scaffolding from basic to intermediate grammatical concepts, and (3) sufficient practice activities to consolidate language skills. Lower ratings emerged only in relation to teachers' requests for differentiated enrichment content, including advanced-level challenges for high achievers and more authentic reading texts beyond constructed examples, reflecting the need to balance curricular completeness with differentiation in heterogeneous classrooms (Widiananda et al., 2023).

Teachers rated the interactivity dimension at 100%, validating its pedagogical efficacy in shifting learners from passive recipients to active participants. Gamified quizzes demonstrated substantial motivational impact, evidenced by students' social comparison of badges and achievement indicators, and the application was perceived as effective for extending independent practice beyond classroom hours. This supports findings that interactive multimedia, when pedagogically structured, amplifies learner engagement and learning outcomes (Seventilofa, 2024).

Visual design also achieved a 100% rating, indicating a successful balance between aesthetic appeal and functional sustainability. Teachers valued the age-appropriate interface, readable typography for Arabic and Indonesian text, and optimized font sizing for mobile screens, reinforcing that adherence to visual design principles strengthens long-term usability and adoption (Sebastian et al., 2025).

Language suitability was rated 90%, with teachers noting occasional assumptions of prior knowledge in grammar explanations, signaling a need for additional scaffolding and self-regulated learning supports, consistent with previous research on self-regulation and knowledge activation in digital learning environments (Toharudin, 2023). Overall, the aggregated teacher evaluation score of 91% demonstrates that An-Nasr meets core pedagogical and usability requirements and has strong potential for sustained adoption. Importantly, teachers expressed willingness for continued integration and future effectiveness studies, indicating authentic perceived value rather than nominal approval.

Student Responses

Student evaluations (77% overall – Feasible) reveal strengths and areas that need improvement from the perspective of the leading end-user. The following diagram visually displays the percentage of feasibility for each evaluation component carried out by the respondents.

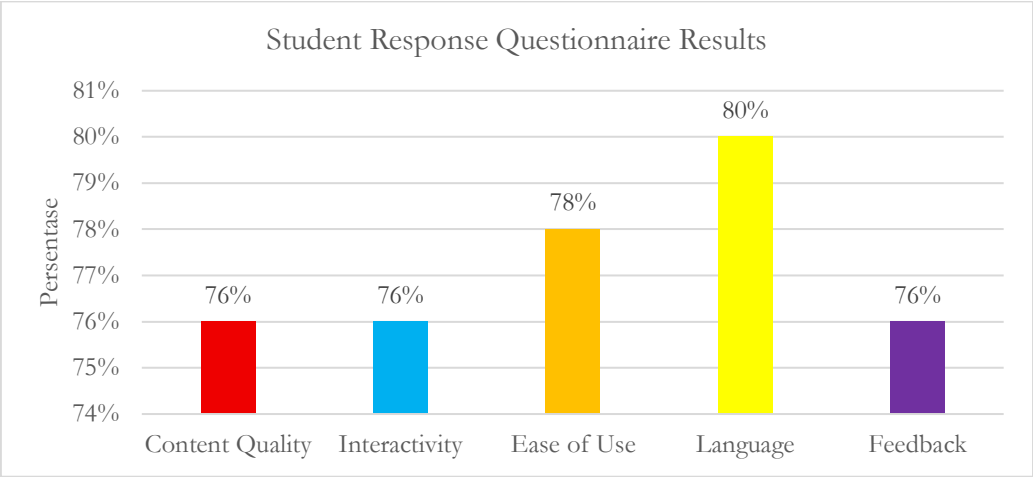

Figure 11 Bar Diagram of Student Response Questionnaire Results

Students evaluated the application's content quality as generally aligned with curriculum objectives and largely comprehensible, supported by clear examples that strengthened conceptual understanding (83%) and acceptable curriculum relevance (77%), yielding an overall content rating of 76%. However, students reported uncertainty about how the four maharah istimāʿ, kalām, qirāʾah, and kitābah are operationalized within learning tasks (72%), and partial opacity in grammatical explanations (73%), revealing that validated material (experts: 92%) may remain linguistically or cognitively inaccessible to some learners. This gap reaffirms that academic soundness does not guarantee learner accessibility, underscoring the need for user-centered design in educational technology (Ilin, 2022).

Interactivity ratings reflected nuanced learner expectations. Although students enjoyed gamified features (83%) and recognized their motivational appeal, perceived engagement (68%) and active participation (77%) varied, indicating that interactivity without meaningful agency can limit involvement. Students described learning flows as guided but not sufficiently participatory, echoing findings that structured instruction benefits beginners but may reduce perceived autonomy (Cody et al., 2020). Usability was rated positively overall (78%), with navigation considered clear (77–80%). However, interviews surfaced non-critical interface frictions, including feature discoverability, progress-tracking confusion, and quiz-to-material re-entry issues, all consistent with the principle that interfaces should demand minimal cognitive load (Stuart & Stuart, 2024).

Language suitability achieved the highest learner rating (80%), suggesting appropriate linguistic calibration (82%) and sufficient vocabulary variation (78%), yet minor lexical barriers persisted for some SMP-background learners, underscoring a need for expanded linguistic scaffolding. The overall student eligibility score of 77% ("Decent"), lower than the expert and teacher evaluations (91–92%), reflects expectation asymmetry, trial duration limits, heterogeneous literacy baselines, and possible questionnaire fatigue, reinforcing the need for multi-stakeholder evaluation to capture learner realities beyond expert judgment.

Comparative Analysis and Overall Quality Assessment

A synthesis of expert validation and user trial data reveals a comprehensive overall quality profile of An-Nasr's app, where all stakeholder groups, subject matter experts, media experts, teachers, and students rate the app at least in the "Feasible" category, thus

confirming the fulfillment of the required basic quality standards. Consistent strengths identified across the evaluation include curriculum-appropriate content coverage, effective multimedia integration supporting multimodal learning, adequate interactivity to increase engagement beyond static materials, and generally exemplary technical implementation without significant functionality issues.

Nonetheless, ranking variations across stakeholder groups provide nuanced insights into different perspectives, as shown in the following diagram:

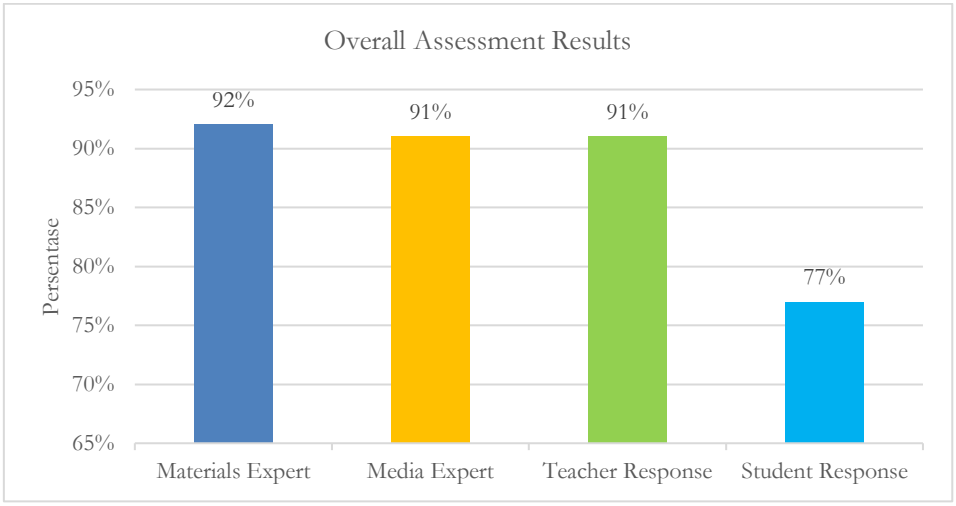

Figure 12 Bar Chart of Overall Assessment Results

This variation reflects a legitimate difference in evaluation priorities rather than a contradiction, as a comprehensive quality assessment requires a pluralistic perspective in which each stakeholder group contributes unique insights, as articulated by Mazza & Azzali (2025).

The combined average of 87.75% in the "Highly Feasible" category represents a weighted synthesis taking into account all stakeholder inputs, which shows that An-Nasr's application successfully meets the established quality criteria across the dimensions of content, technical implementation, and user acceptance, thus demonstrating readiness for wider implementation while recognizing specific areas that require continuous refinement.

An-Nasr's application quality metrics are in line with previous Arabic learning media development studies, as seen from multimedia development Suryani & Ishartiwi (2024), which achieved a content expert rating of 4.45-4.5 and a media expert rating of 4.34-4.95 in the "Excellent" category, as well as mobile interactive media that achieved 88% expert validation for media and 87% for material (Manahijassu'ada et al., 2023), both of which are very much in line with the results of An-Nasr's validation. Consistency across these studies suggests that the systematic application of development models such as ADDIE, combined with rigorous validation processes, can be relied upon to produce high-quality educational technologies. Yet, the variation in student responses across the study, ranging from 77% to 85%, underscores the importance of user-centric refinements beyond mere expert validation.

Discussion

The needs analysis confirms that grammar mastery is the most persistent obstacle in secondary Arabic learning, with over half of learners (53.3%, n=8) identifying *qawāʿid* as their primary difficulty. This supports evidence that Arabic's morphosyntactic complexity creates a structural acquisition barrier for non-Semitic language learners (Muna et al., 2024) and reinforces the pedagogical need for explicit rule instruction combined with contextualized, interactive practice (Allen, 2019). The prototype design of An-Nasr, which prioritizes a structured *qawāʿid* module, is therefore theoretically and empirically justified.

A key contribution of this study lies in identifying a systemic paradox in technology adoption: while many students had previously used language apps (Duolingo: 53.3%; translation apps: 33.3%), nearly half reported never using smartphones for Arabic learning (46.7%, n=7). However, mobile learning remained the most preferred learning format (40%, n=6), suggesting that low usage is not caused by motivation, but by lack of curriculum-aligned MALL (MALL) applications and limited teacher confidence in smartphone-mediated learning integration. This aligns with prior assertions that technology availability does not guarantee learning uptake without pedagogical alignment and perceived usefulness (Alisoy & Sadiqzade, 2024).

Although expert validators rated content feasibility at 92%, students' perceptions of content accessibility were lower (76%), suggesting that academic validity does not automatically ensure learner comprehensibility (Ilin, 2022). Students expressed uncertainty regarding skill integration across the four maharah (72%). They found some grammar explanations unclear (73%), confirming that linguistic scaffolding and skill-alignment signaling must be made more explicit, especially for learners with limited prior Arabic literacy. This finding reinforces the importance of multi-stakeholder evaluation and learner-centered refinements beyond expert judgment.

The interactivity dimension achieved 100% teacher approval and 83% student enjoyment, validating the motivational impact of gamified assessments, live feedback, and multimedia interaction (Seventilofa, 2024). However, lower engagement ratings (68%) indicate that interactivity without meaningful agency can reduce perceived autonomy, particularly when learners feel confined to predetermined learning paths (Cody et al., 2020). Usability results (78%) further show that navigation hierarchies and progress-tracking clarity must be simplified, consistent with the principle that interfaces should require minimal cognitive effort to operate (Stuart & Stuart, 2024).

Overall, the prototype demonstrates acceptable student feasibility (77%) and high teacher feasibility (91%), reflecting a legitimate expectation asymmetry between students and educators, in which learners may benchmark digital learning tools against commercial gaming experiences rather than pedagogical criteria alone. Similar variations have been reported in prior learning-media R&D, reinforcing that expert-validated ADDIE prototypes are reliable foundations for educational app development, yet must be complemented by iterative, user-centered optimization to address learner heterogeneity.

The findings also highlight an essential instructional-design implication regarding the nature of grammar learning in MALL environments. Because Arabic grammar is a high-intrinsic-cognitive-load domain, expert validation alone cannot predict whether learners can process explanations efficiently during independent mobile use. The gap between expert feasibility (92%) and student accessibility (76%) indicates the presence of extraneous load

induced by presentation density and implicit skill mapping, rather than conceptual invalidity. This aligns with cognitive-load assumptions in digital learning, where complex rule-based language systems require not only explicit instruction but also progressive scaffolding, segmentation, and clear *maharah*–task signaling to enable schema construction across heterogeneous learners.

Furthermore, the observed agency deficit in interactivity scores (teacher 100% vs. student engagement 68%) suggests that learners differentiate between interaction and autonomy. While gamified quizzes successfully generate affective engagement, sustained behavioral engagement depends on whether students feel empowered to navigate, skip, or revisit learning paths according to their competence level. This supports sociocultural assertions that scaffolding must adapt to learner entry points within the zone of proximal development (ZPD), ensuring equitable competence attainment without suppressing autonomy perception. Therefore, future iterations should emphasize adaptive pathways, transparent progress dashboards, optional review loops, and lightweight, multimodal guidance to convert enjoyable interactions into meaningful, self-directed learning participation, thereby strengthening both uptake and instructional usability.

CONCLUSION

This study successfully developed and validated the An-Nasr mobile application for Arabic language learning by systematically applying the Analysis, Design, and Development stages of the ADDIE model. Grounded in empirical needs analysis and relevant theoretical frameworks, the development process resulted in an interactive multimedia application that achieved an overall quality score of 87.75%, categorized as very feasible based on expert and user evaluations. The findings demonstrate that integrating multimedia learning principles with Arabic pedagogy in an Islamic educational context can produce a pedagogically sound and technologically effective Mobile-Assisted Language Learning (MALL) application.

The An-Nasr application offers a practical, context-sensitive solution to several persistent challenges in Arabic language instruction, including limited access to interactive media, inadequate visualization of grammatical concepts, and low learner engagement with conventional teaching methods. Its offline functionality and user-friendly interface enable effective implementation in resource-limited educational settings. Nevertheless, this study has notable limitations, particularly the restriction of the development process to three ADDIE stages, the small sample size, and the single-institution research context, which collectively constrain the comprehensive assessment of learning effectiveness and the generalizability of the findings.

Future research should address these limitations by completing the Implementation and Evaluation stages of the ADDIE model through controlled experimental and longitudinal studies across diverse institutional settings. Further development should also incorporate adaptive learning pathways, enhanced social learning features, teacher-learning analytics, and expanded instructional content. From a theoretical perspective, future studies are encouraged to examine the relationships between MALL design elements, multimedia integration, gamification, and Arabic language learning outcomes. Overall, the An-Nasr application not only contributes a practical instructional tool but also provides a replicable development framework for designing culturally and pedagogically appropriate MALL applications in Islamic education contexts.

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AUTHOR CONTRIBUTIONS STATEMENT

KA contributes to the conceptualization of research, methodological supervision, and manuscript review. MN is responsible for the needs analysis, design, and development of the An-Nasr application, data collection and analysis, and the preparation of the initial script. EG contributes to research methodology, application development oversight, verification of findings, and revision and editing of final manuscripts. All authors verify and approve the final published version.

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