DESIGNING *TALABY*: AN ANDROID-BASED DIGITAL MODULE TO ENHANCE STUDENTS' LEARNING OUTCOMES IN ARABIC LANGUAGE EDUCATION

Anggi Nurul Baity[1], Rifatul Masitoh[2]
[1,2]Universitas Islam Negeri Syekh Wasil Kediri, Indonesia
E-mail: [1]anggibaity@uinkediri.ac.id*, [2]rifatulmasitoh7@gmail.com

Abstract: The rapid advancement of mobile technologies has created new opportunities for enhancing language learning through flexible and learner-centered instructional media. In response to this development, this study aimed to design and evaluate *Talaby*, an Android-based digital learning module developed to support Arabic language instruction and improve students' learning outcomes. The study was conducted at an Islamic senior secondary school (MAN 1 Kediri, Indonesia) and employed the ADDIE development model within a Research and Development (R&D) framework. A total of 26 tenth-grade students participated in the study. Data were collected through observations, interviews, questionnaires, and achievement tests. The validation results indicated that *Talaby* met the feasibility standards, with media and content validation scores of 78% and 86%, respectively. Furthermore, a paired-sample t-test revealed a statistically significant improvement in students' learning outcomes after using the module ($p < 0.05$), with a large effect size (Cohen's $d \approx 1.30$). These findings suggest that *Talaby* effectively facilitates active, contextual, and learner-centered Arabic language learning, highlighting the potential of Android-based digital modules as innovative instructional media in language education, particularly in secondary education contexts.

Keywords: *Talaby*, Android-Based Learning, Digital Learning Module, Arabic Language Education, Learning Outcomes

Introduction

Education in the 21st century has undergone a substantial paradigm shift, moving beyond content mastery toward the development of essential skills such as critical thinking, creativity, collaboration, and communication. This transformation has significant

implications for instructional practices, particularly the integration of digital technologies into teaching and learning processes.[1] Learners are increasingly expected to access, evaluate, and utilize information from diverse digital sources, while teachers are required to adapt pedagogical strategies and instructional materials to align with rapid technological advancements.[2] Consequently, technology integration has become a central component of effective and relevant contemporary education.

Globalization and digitalization have further accelerated the adoption of technology in educational contexts.[3] Digital literacy is no longer considered an optional skill but a fundamental competence for both teachers and students. Mobile technologies, especially smartphones, offer flexible and accessible learning opportunities that support independent and collaborative learning beyond the constraints of time and place.[4] In this regard, Android-based learning applications have gained increasing attention due to their affordability, widespread use, and potential to facilitate interactive and contextualized learning experiences.

Within Arabic language education, the challenges extend beyond linguistic complexity to include learners' motivation and engagement.[5]

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[1] Herlinawati Herlinawati et al., "The Integration of 21st Century Skills in the Curriculum of Education," *Heliyon* 10, no. 15 (August 2024), https://doi.org/10.1016/j.heliyon.2024.e35148; Anggi Nurul Baity and Putri Kholida Faiqoh, "Optimizing Arabic Learning for University Students through 4c Skills of 21st Century," *Journal of Arabic Education* 02 (2022): 2.

[2] Asmayawati, Yufiarti, and Elindra Yetti, "Pedagogical Innovation and Curricular Adaptation in Enhancing Digital Literacy: A Local Wisdom Approach for Sustainable Development in Indonesia Context," *Journal of Open Innovation: Technology, Market, and Complexity* 10, no. 1 (2024): 100233, https://doi.org/10.1016/j.joitmc.2024.100233.

[3] Aidan Michael McCarthy et al., "Digital Transformation in Education: Critical Components for Leaders of System Change," *Social Sciences and Humanities Open* 8, no. 1 (2023): 100479, https://doi.org/10.1016/j.ssaho.2023.100479; Muhamad Hamsan Wadi, Rusli Malli, and Muammar Asykur, "Digital Age Education Management Strategies in Facing Global Changes in Islamic Education," *Business and Applied Management Journal* 1, no. 1 (2023): 23–36, https://doi.org/10.61987/bamj.v1i1.355.

[4] Ruichen Yuan, Habibah Ab Jalil, and Muhd Khaizer Omar, "Adopting Strategies of Mobile Technology for Assisted Learning Performance in Higher Education in China," *Computers and Education Open* 8, no. May (2025): 100263, https://doi.org/10.1016/j.caeo.2025.100263; Liza Husnita et al., "The Role of Mobile Technology in Improving Accessibility and Quality of Learning," *Al-Fikrah: Jurnal Manajemen Pendidikan* 11, no. 2 (2023): 259, https://doi.org/10.31958/jaf.v11i2.10548.

[5] Sultan Almelhes, "Enhancing Arabic Language Acquisition: Effective Strategies for Addressing Non-Native Learners' Challenges," *Education Sciences* 14, no. 10 (2024): 1116, https://doi.org/DOI:10.3390/educsci14101116.

Arabic language learning is often perceived as difficult and monotonous, particularly when instructional practices rely heavily on teacher-centered approaches and conventional textbooks. Such practices may limit students' active participation and reduce learning effectiveness.[6] Integrating digital instructional materials, therefore, presents a promising approach to addressing these challenges. Digital learning modules can incorporate multimedia elements, such as audio, video, interactive exercises, and self-assessment tools, that support vocabulary acquisition, grammatical understanding, and contextual language use in more engaging and meaningful ways.

Instructional materials play a crucial role in facilitating effective learning. Well-designed materials should be systematically structured, aligned with curriculum objectives, and responsive to learners' diverse needs.[7] Instructional modules, in particular, are designed to promote learner autonomy by enabling students to engage with content independently. Android-based instructional modules offer additional advantages by allowing learners to access materials anytime and anywhere through their personal devices. These features have been shown to enhance learners' motivation, engagement, and learning outcomes, especially when combined with interactive and multimedia-supported content.[8]

Despite the growing availability of digital technologies, many educational institutions have not yet utilized these tools optimally. Preliminary observations and interviews conducted with Arabic language teachers at MAN 1 Kediri, Indonesia, revealed that Arabic instruction is still predominantly delivered through conventional

[6] Diana Putri Oktavian, "Arabic Language Learning Difficulties in Indonesian Islamic Schools : Linguistic and Non-Linguistic Perspectives" 9, no. 1 (2026): 153–75; Abdillah Mahbubi, "Conventional and Contemporary Arabic Language Teaching Methods: A Comparative Analysis," *Alsina : Journal of Arabic Studies* 6, no. 2 (2024): 205–28, https://doi.org/10.21580/alsina.6.2.23307.

[7] K Miremba Bacia, "Role of Instructional Materials in Students' Academic Performance," *Research Invention Journal of Current Research in Humanities and Social Sciences* 3, no. 2 (2024): 24–27; Muh Sabilar Rosyad, "Student-Centered Arabic Teaching Materials in Internasional Undergraduate Programs: Empirical Evidence from UIN Sunan Kalijaga Yogyakarta," *PROSIDING KONIPBSA: Konferensi Nasional Inovasi Pembelajaran Bahasa Dan Sastra Arab* 5, no. 1 (2025): 217–32.

[8] Sujarwo et al., "Android-Based Interactive Media to Raise Student Learning Outcomes in Social Science," *International Journal of Interactive Mobile Technologies* 16, no. 7 (2022): 4–21, https://doi.org/10.3991/ijim.v16i07.25739; Andi Maria Ulfa, Kristian H. Sugiyarto, and Jaslin Ikhsan, "The Effect of the Use of Android-Based Application in Learning Together to Improve Students' Academic Performance," *AIP Conference Proceedings* 1847 (2017), https://doi.org/10.1063/1.4983910.

methods. Teachers rely mainly on printed textbooks provided by publishers and government-issued materials, while instructional strategies tend to be teacher-centered. As a result, students often assume a passive role in the learning process, which negatively affects their participation and learning outcomes.

Furthermore, conventional instructional practices often fail to accommodate learners' diverse learning preferences and needs.[9] Contemporary curricula emphasize differentiated instruction and learner-centered approaches that recognize individual differences among students.[10] In this context, Android-based instructional modules offer a viable alternative, as they can support personalized, adaptive, and contextual learning experiences. Such modules not only present instructional content but also incorporate learning activities designed to foster critical thinking and active learner engagement.

Previous studies have reported positive effects of Android-based instructional materials on students' engagement and learning outcomes. Research by Pujianto[11]., Arini et.al[12], and Rofi'i and Susilo[13] demonstrated that Android-based modules enhance students' learning achievement by providing easy access to materials, attractive interfaces, and self-evaluation features. However, despite these promising

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[9] Norhayati Husin and Wan Najmiyyah Wan Md Adnan, "A Systematic Literature Review on Differentiated Instruction Practices in English Classrooms (2020–2025)," *International Journal of Research and Innovation in Social Science (IJRISS)* VII, no. 2454 (2025): 1175–89, https://doi.org/10.47772/IJRISS.2025.910000710.

[10] Tutut Handayani et al., "Implementation of Differentiated Instruction Strategies for Students' Learning Motivation in Islamic Elementary School," *JIP (Jurnal Ilmiah PGMI)* 11, no. 2 (2025): 187–200; Darius Ap et al., "Differentiated Learning in the Merdeka Curriculum: A Literature Review on School Practices," *Journal of English Language and Education* 10, no. 4 (2025): 1535–44; Fitri Faradila Notanubun, Jeny Lekatompessy, and Bella Camerling, "Differentiated Instruction in Merdeka Belajar Curriculum: Teachers' Perception in EFL Context," *MATAI: International Journal of Language Education* 5, no. 2 (2025): 155–69, https://doi.org/10.30598/matail.v5i2.18349.

[11] Pujianto, "The Influence of Mobile Learning-Based Learning Media on Learning Outcomes in Arabic Language," *Prosiding Konferensi Nasional Inovasi Pembelajaran Bahasa Dan Sastra Arab* 3 (2023): 88–97.

[12] Arini Fakhria Arifah, Ubaidillah Ubaidillah, and Abd Muhith, "Introducing Android-Based Digital Learning Media Assisted by ISpring Suite in Science and Social Studies Learning in Elementary Schools," *Journal of Educational Research and Practice* 3, no. 1 (2025): 149–66, https://doi.org/10.70376/jerp.v3i1.352.

[13] Agus Rofi'i and Sigit Vebrianto Susilo, "The Development of Teaching Materials Based on Mobile Learning in English Learning for Elementary Schools," *AL-ISHLAH: Jurnal Pendidikan* 15, no. 2 (2023): 2062–75, https://doi.org/10.35445/alishlah.v15i2.2475.

findings, research focusing on the development and empirical evaluation of Android-based instructional modules specifically for Arabic language education at the secondary school level remains limited.

Addressing this gap, the present study aims to design and evaluate *Talaby*, an Android-based digital instructional module for Arabic language learning. This study seeks to examine the feasibility and effectiveness of the developed module in improving students' learning outcomes in a secondary education context, thereby contributing to the growing body of research on mobile learning and digital innovation in Arabic language education.

Literature Review

Mobile Learning and Android-Based Instructional Modules

Mobile learning has emerged as a prominent approach in contemporary education, driven by the widespread adoption of smartphones and advances in digital technology.[14] Mobile learning is commonly defined as learning that occurs through portable digital devices, enabling flexible, personalized, and context-aware learning experiences.[15] Among various mobile platforms, Android has gained particular prominence in educational contexts due to its open-source nature, affordability, and extensive global user base, especially in developing countries.

Android-based instructional modules represent a structured form of mobile learning content designed to support independent and guided learning. Unlike standalone learning applications, instructional modules emphasize pedagogical organization, learning objectives, learning activities, and assessment components. Previous studies have shown that Android-based modules can enhance learners' engagement and academic performance by providing interactive multimedia content, immediate feedback, and self-paced learning opportunities.[16] These

[14] Isnaini Nur Safitri and Pritantina Yuni Suyono, Achmad, Lestari, "Developing Bilingual Synchronized Audio for Android Application of East Java Tourist Attraction Legend," *JALIE: Journal of Applied Linguistics and Islamic Education* 08, no. 02 (2024): 239–56.

[15] Sofia Moya and Mar Camacho, "Leveraging AI-Powered Mobile Learning: A Pedagogically Informed Framework," *Computers and Education: Artificial Intelligence* 7, no. August (2024): 100276, https://doi.org/10.1016/j.caeai.2024.100276.

[16] Firdaus Budhi Armanto, Nurmida Catherine Sitompul, and Nunung Nurjati, "Walk Band for Better Learning: An Android-Based Music Module to Enhance Student Outcomes," *Jurnal Edutech Undiksha* 13, no. 1 (2025): 21–33, https://doi.org/10.23887/jeu.v13i1.95023; Titi Sriwahyuni et al., "Android-Based

features position Android-based modules as effective instructional media rather than mere technological supplements.

Digital Learning Modules and Learning Outcomes

Learning outcomes are commonly conceptualized as measurable changes in learners' knowledge, skills, and attitudes resulting from instructional interventions.[17] In digital learning environments, learning outcomes are influenced not only by content quality but also by instructional design, interactivity, and learner engagement.[18] Well-designed digital learning modules can support meaningful learning by aligning learning objectives, instructional activities, and assessment strategies within a coherent pedagogical framework.

Empirical evidence suggests that digital modules contribute positively to learning outcomes when they are interactive, learner-centered, and aligned with instructional goals. Multimedia elements, such as audio narration, visual representations, and interactive exercises, can reduce cognitive load and facilitate deeper understanding when designed according to multimedia learning principles. In mobile learning contexts, the portability and accessibility of digital modules further support continuous learning beyond classroom boundaries, which has been associated with improved academic achievement and learner motivation. [19]

Digital Learning Media: Improving Interactivity in Analysis and Design of Systems Course," *Data and Metadata* 4 (2025), https://doi.org/10.56294/dm2025523; Arifah, Ubaidillah, and Muhith, "Introducing Android-Based Digital Learning Media Assisted by ISpring Suite in Science and Social Studies Learning in Elementary Schools."

[17] Chaiyut Kleebbua and Thomrat Siriparp, "Effects of Education and Attitude on Essential Learning Outcomes," *Procedia - Social and Behavioral Sciences* 217 (2016): 941–49, https://doi.org/10.1016/j.sbspro.2016.02.061.

[18] Nadya Putri Fitriani et al., "The Impact Of Digital Learning Technology On The Quality Of Education In Indonesia" 14, no. 4 (2025): 3142–54.

[19] Putri Kholida Faiqoh, Hamida Gadoum, and Anggi Nurul Baity, "Digital Media and Technology in Arabic Language Learning," *Journal of Arabic Language Teaching* 5, no. 1 (2025): 121–32, https://doi.org/10.35719/arkhas.v5i1.2263; Elok Robiatul Adawiyah, Ahmad Winarno, and Saifaldin Idris Onia, "Effectiveness of Interactive Learning Media Development Based on Articulate Storyline 3 in Elementary School Education," *EDUCARE: Journal of Primary Education* 5, no. 2 (2024): 105–18, https://doi.org/10.35719/educare.v5i2.253; Stella Talitha et al., "Interactive E-Module Based on Canva to Improve Students' Negotiation Text Competence," *International Journal of Education and Teaching Zone* 4, no. 3 (2025): 323–40; Nurlaela Pitaloka, "The Impact of Video-Based Microlearning on Student Learning Outcomes and Motivation," *Journal of Education Innovation and Curriculum Development* 03, no. 02 (2025): 72–79.

Arabic Language Learning in Digital Environments

Arabic language education presents unique pedagogical challenges due to its linguistic complexity, diglossic nature, and orthographic characteristics. Traditional instructional approaches in Arabic language learning often rely heavily on teacher-centered explanations and textbook-based instruction, which may limit learners' opportunities for active language use and contextualized practice. As a result, students may experience low motivation and difficulty in developing functional language proficiency. [20]

Recent studies have highlighted the potential of digital technologies to address these challenges by providing multimodal and interactive learning experiences.[21] Digital learning modules can integrate audio pronunciation models, visual contextual cues, and interactive exercises that support vocabulary acquisition, grammatical understanding, and communicative competence. In the context of mobile learning, Android-based applications have been shown to facilitate frequent exposure to language input and opportunities for practice, which are essential for effective language learning.[22] However, research specifically examining structured Android-based instructional modules for Arabic language learning at the secondary level remains limited, indicating a need for further empirical investigation.

Theoretical Framework

The development of digital instructional media should not only focus on technological innovation but also be grounded in sound learning theories that explain how and why such media can support effective learning. In the context of mobile-assisted language learning, the design of digital modules needs to be informed by theoretical perspectives that connect instructional design, learner engagement, and learning outcomes. Therefore, the development of the *Talaby* Android-based module in this study is conceptually supported by three complementary theoretical foundations: Mayer's multimedia learning

[20] Lu Zakiyah and Evi Khulwati, "Comparative Study : Traditional and E-Learning Approaches in Arabic Language Teaching," *Proceeding of International Conference on Islamic Studies* 7, no. 1 (2025).

[21] Yumei Zou et al., "Digital Learning in the 21st Century: Trends, Challenges, and Innovations in Technology Integration," *Frontiers in Education* 10 (2025), https://doi.org/10.3389/feduc.2025.1562391.

[22] Matius Tandikombong, Judith Ratu Tandi Arrang, and Yusem Ba'ru, "The Effectiveness of Mobile Phones Applications in Learning English Vocabularies," *Jurnal Sinestesia* 13, no. 2 (2023): 1402–12.

theory, constructivist learning theory, and Biggs' constructive alignment.

Mayer's Cognitive Theory of Multimedia Learning provides an important basis for designing multimedia-supported instructional materials.[23] This theory explains that learners process information through both visual and auditory channels, and meaningful learning occurs when these channels are used in a balanced and well-organized manner. Mayer highlights several design principles, such as the multimedia principle and the modality principle, which emphasize the effective integration of text, images, and audio to facilitate understanding. In the context of language learning, these principles are particularly valuable because they allow learners to experience linguistic input in multiple forms. For example, combining written vocabulary with audio pronunciation and visual illustrations can help students better understand and remember new language elements. The *Talaby* module adopts these principles by incorporating multimedia features such as audio pronunciation, visual representations, and interactive exercises to support students' comprehension of Arabic language materials.

In addition, the learning design of the module is closely related to constructivist learning theory, which views learning as an active process in which learners construct knowledge through interaction with learning materials and experiences.[24] From a constructivist perspective, students are not merely passive recipients of information but active participants in the learning process. Mobile learning technologies provide opportunities to support this approach by allowing learners to explore materials independently, learn at their own pace, and revisit instructional content when needed. The *Talaby* module was therefore designed to encourage student-centered learning through structured learning activities and interactive features that allow learners to actively engage with Arabic language content and develop their understanding gradually.

Furthermore, the instructional structure of the module is guided by Biggs' theory of constructive alignment, which emphasizes the importance of aligning learning objectives, learning activities, and assessment. According to this framework, effective learning occurs

[23] R. E Mayer, "Multimedia Learning. In Psychology of Learning and Motivation," *Academic Press* 41 (2002): 85–139.

[24] A Suhendi and . Purwarno, "Constructivist Learning Theory: The Contribution to Foreign Language Learning and Teaching," *KnE Social Sciences* 3, no. 4 (2018): 87, https://doi.org/10.18502/kss.v3i4.1921.

when instructional components are designed to support the same learning goals in a coherent manner.[25] In the development of *Talaby*, the learning objectives were derived from the curriculum used at the school, while the learning activities within the module were designed to facilitate the development of Arabic language skills such as vocabulary, listening, speaking, reading, writing, and grammar. The assessment components included in the module were also designed to measure students' understanding in relation to these objectives.

Taken together, these theoretical perspectives provide a conceptual foundation for the development of the *Talaby* module. By integrating multimedia learning principles, constructivist learning approaches, and constructive alignment, the module is designed not only as a technological innovation but also as a pedagogically grounded learning resource that supports meaningful Arabic language learning.

Method

This study employed a Research and Development (R&D) approach, which is widely used to design, develop, and validate educational products through systematic procedures and empirical testing. R&D is intended not only to produce instructional products but also to examine their feasibility and effectiveness within real educational contexts.[26] In line with this purpose, the present study focused on developing an Android-based digital learning module grounded in learners' needs, followed by expert validation and field testing to evaluate its effectiveness.

The development process was guided by the ADDIE instructional design model, which consists of five iterative stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was selected due to its clear structure, flexibility, and suitability for educational product development. It allows researchers to conduct a comprehensive needs analysis, design instructional components systematically, develop and validate learning materials, implement the product in authentic learning settings, and evaluate both its feasibility and learning impact.

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[25] J. Biggs, "Constructive Alignment in University Teaching," *HERDSA Review of Higher Education* 1 (2014): 624–25.

[26] Linda Afriani, Mutmainnah, and Sunarni, "Understanding the Design of Research and Development Methods in the Field of Education," *IJESS International Journal of Education and Social Science* 6, no. 1 (2025): 1–5, https://doi.org/10.56371/ijess.v6i1.333.

Result and Discussion

Development of the *Talaby*: Android-Based Instructional Module

Analysis Phase; The analysis phase aimed to identify instructional needs, learner characteristics, and curricular requirements as the foundation for developing the Android-based instructional module. This phase was conducted through classroom observations and in-depth interviews with Arabic language teachers and students at MAN 1 Kediri, Indonesia.

The findings revealed that although teachers had delivered instructional content clearly and utilized presentation media such as PowerPoint slides, the instructional materials employed were not yet optimal. The learning resources relied primarily on printed textbooks and conventional materials, which were found to be insufficiently aligned with the current curriculum and learners' needs. As a result, classroom instruction tended to be teacher-centered, limiting students' active participation and leading to difficulties in understanding the learning materials. These conditions were reflected in students' low engagement and suboptimal learning outcomes.

Further analysis indicated that students demonstrated better comprehension when instructional materials were supported by concrete illustrations and audio elements. This finding suggests that learners required multimodal learning resources to facilitate understanding, particularly in Arabic language learning, which involves complex linguistic features such as pronunciation, vocabulary, and grammatical structures. These results are consistent with previous studies highlighting the importance of multimedia support in enhancing language learning comprehension and engagement.

The analysis also showed that MAN 1 Kediri had officially implemented the Merdeka Curriculum and institutionally supported the integration of digital learning media. However, this potential had not been fully utilized in classroom practice. Digital technology was available but had not yet been systematically integrated into instructional materials that promote active and independent learning. This gap between curriculum expectations and instructional implementation underscores the need for well-designed digital learning modules that align with curricular objectives while addressing learners' characteristics.

From a pedagogical perspective, these findings highlight the limitations of conventional instructional approaches in meeting the demands of contemporary, learner-centered education. The results reinforce the argument that instructional materials should not only

deliver content but also facilitate interaction, autonomy, and contextual learning experiences. Therefore, the analysis phase provided a strong empirical rationale for developing *Talaby*, an Android-based instructional module designed to support Arabic language learning through interactive, multimedia-enhanced, and curriculum-aligned instructional content.

Design Phase; The design phase focused on developing the structural framework and content organization of the Android-based instructional module. Based on the results of the needs analysis, learning objectives, content scope, and instructional sequences were defined to ensure alignment with curricular requirements and students' learning needs. The materials were organized into coherent learning units to support systematic and self-directed learning.

A storyboard was then created to visualize the layout and navigation flow of the module. This storyboard served as a design guide for translating instructional content into a functional Android application, including the arrangement of text, visuals, audio elements, and interactive components. The storyboard helped ensure clarity, consistency, and usability of the module prior to the development stage.

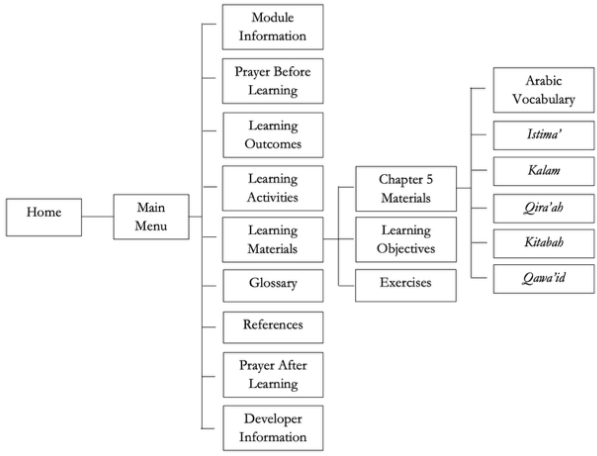


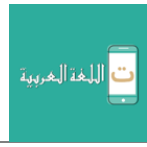
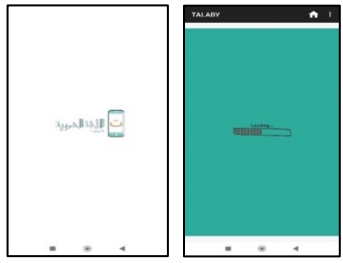
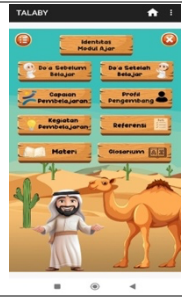
Figure 1. Storyboard of the Android-Based Instructional Module

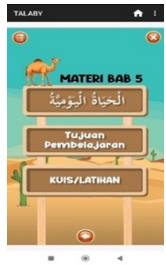
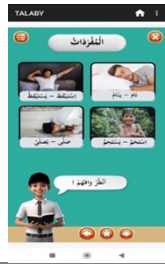
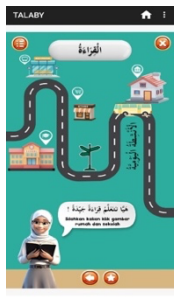
Development Phase; The development phase involved transforming the design outcomes into a functional Android-based instructional module. Activities at this stage included producing animations and integrating visual elements, audio, and video, as well as embedding Arabic language instructional content into the application. The module

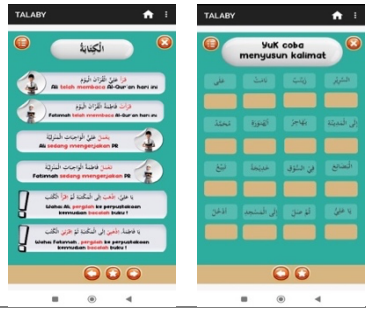
was developed using iSpring Suite and Website 2 APK Builder to ensure compatibility with Android devices.

In addition, the development process included packaging the application and conducting internal reviews to examine the functionality and consistency of the module. These reviews aimed to ensure that all instructional components operated as intended and that the application was ready for implementation in the learning context. The final product specifications of the application after installation on Android devices are presented in Table 1.

Table 1. Application Product Specifications after Installation on Android Devices

Specifications	**User Interface**
Application Name	*TALABY*
Learning Materials	الحياة اليومية (Daily Life)
Application Logo	
Cover Page	
Main Menu	

Materials Menu	
Vocabulary (*Mufrodat*) Learning Page	
Listening (*Istimā'*) Learning Page	
Speaking (*Kalām*) Learning Page	
Reading (*Qirā'ah*) Learning Page	 

Writing (*Kitābah*) Learning Page	
Grammar (*Qawāʿid*) Learning Page	
Assessment	

After the application was completed, expert validation was conducted to assess the feasibility of the developed module. The validation involved two experts: a media expert and a content expert. This process aimed to evaluate the quality of the instructional design, technical aspects, and the accuracy and suitability of the Arabic language content. Based on the validation results, the scores provided by the experts are presented in Table 3. The findings indicate that the Android-based instructional module met the feasibility criteria and was considered suitable for implementation in the learning process.

Table 2. Media Expert Validation Results

No	Indicator	Score	Percentage	Category
1	Accessibility aspect	17	85%	Feasible
2	Visual design aspect	67	74%	Fairly Feasible
3	Content quality aspect	78	76%	Feasible
	Average	**81**	**78%**	**Feasible**

Table 3. Content Expert Validation Results

No	Indicator	Score	Percentage	Category
1	Curriculum alignment aspect	19	95%	Highly feasible
2	Content and material quality aspect	54	90%	Highly feasible
3	Language aspect	44	73%	Fairly feasible
4	Evaluation aspect	17	85%	Feasible
	Average	**67**	**86%**	**Feasible**

The expert validation results indicate that the developed Android-based instructional module meets the feasibility standards for classroom implementation. Media validation showed an average feasibility score of 78%, with accessibility rated as feasible (85%), visual presentation as fairly feasible (74%), and content quality as feasible (76%). Meanwhile, content validation yielded a higher overall feasibility score of 86%, with strong alignment to the curriculum (95%) and high content quality (90%), while the language aspect was rated as moderately feasible (73%) and the assessment component as feasible (85%). Overall, these findings suggest that the module is pedagogically sound and technically appropriate, supporting its implementation in authentic learning settings.

Implementation Phase; During the implementation phase, the validated instructional module was tested on a larger scale using a one-group pretest–posttest design involving 26 tenth-grade students from class X-D. The pretest results indicated a mean score of 49, with most students not meeting the minimum mastery criteria.

The Android-based instructional module was then implemented over four instructional sessions. The implementation began with an orientation session to familiarize students with the use of the module, followed by learning activities conducted progressively from simpler to more complex materials, guided by a constructivist learning approach. After the completion of the instructional sessions, a posttest was administered. The results demonstrated a substantial improvement in students' learning outcomes, with the mean score increasing to 85, and 22 students achieving scores above the minimum mastery threshold.

In addition to achievement data, students' perceptions of the module were collected through a questionnaire. The findings revealed very positive responses, with an average score of 4.47 (89%), which falls within the feasible category. These results indicate that the Android-

based instructional module was well received by students and effectively supported the learning process.

Evaluation Phas; The evaluation phase involved revising the module and analyzing the overall data obtained from the implementation stage. The findings indicated that the Android-based instructional module effectively improved students' learning outcomes. The improvement in achievement scores suggests that the module functioned as intended in supporting the learning process.

Nevertheless, several limitations were identified during the evaluation. These included the module's compatibility being restricted to Android devices, the relatively large application size that may potentially cause performance issues, limited audio clarity in certain sections, and the restricted use of animation and interactive features. Despite these limitations, the module demonstrated notable strengths, particularly in its clear and engaging presentation of instructional content. These strengths contributed to increased student engagement and enthusiasm throughout the learning activities.

Effectiveness of the *Talaby:* Android-Based Instructional Module in Improving Students' Learning Outcomes

The effectiveness of the Android-based instructional module *Talaby* was examined using pretest and posttest data obtained from 26 tenth-grade students. Students' learning outcomes were measured using a 20-item multiple-choice test administered before and after the implementation of the module. The collected data were analyzed using SPSS Statistics version 22.

Prior to conducting inferential statistical analysis, a normality test was performed to determine whether the pretest and posttest data were normally distributed. The Shapiro–Wilk test was employed, with a significance level of 0.05. Data are considered normally distributed when the significance value exceeds 0.05.

The results of the normality test are presented in Table 5. The significance values for the pretest and posttest scores were 0.111 and 0.166, respectively, both of which are greater than 0.05. These findings indicate that the pretest and posttest data were normally distributed, allowing for the use of parametric statistical analysis.

Table 4. Paired-Sample t-Test Results

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Postetst	-35.000	11.576	2.270	-39.676	-30.324	-15.417	25	.000

Following the normality test, a paired-sample t-test was conducted to examine whether there was a statistically significant difference between students' pretest and posttest scores after using the Android-based instructional module. The following hypotheses were tested:

> H_0: There is no significant difference between the mean pretest and posttest scores, indicating that the module is not effective.
>
> H_1: There is a significant difference between the mean pretest and posttest scores, indicating that the module is effective.

The decision criterion was based on a significance level of 0.05. If the significance value was less than 0.05, the alternative hypothesis (H_1) was accepted. The results of the paired-sample t-test are presented in Table 6. The analysis showed a significance value (2-tailed) of 0.000, which is below the threshold of 0.05. Therefore, H_1 was accepted.

The significant improvement in students' learning outcomes indicates that the *Talaby* module functioned not merely as a digital supplement but as an effective pedagogical intervention. Its integration of multimodal input (text, audio pronunciation, visuals, and interactive tasks) directly addresses learners' previously identified difficulties in understanding abstract Arabic linguistic features. Such design aligns with Mayer's Cognitive Theory of Multimedia Learning, which posits that coordinated visual and auditory channels facilitate deeper processing and retention of information. In Arabic language education, where phonological accuracy, vocabulary acquisition, and orthographic awareness are essential, multimedia-supported modules provide richer input than conventional textbooks, thereby enhancing comprehension and engagement.[27] These findings confirm that technology-enhanced materials can operationalize learner-centered instruction and improve academic performance.

Furthermore, the module's structure (covering mufrodat, *istimāʿ*, *kalām*, *qirāʾah*, *kitābah*, and *qawāʿid*) reflects an integrated skills approach consistent with contemporary Arabic language pedagogy. From a constructivist perspective, the opportunity for self-paced exploration and repeated exposure enables learners to actively construct linguistic knowledge through interaction with meaningful content rather than passive reception. This is particularly relevant in foreign language

[27] Mayer, "Multimedia Learning. In Psychology of Learning and Motivation"; Faiqoh, Gadoum, and Baity, "Digital Media and Technology in Arabic Language Learning."

contexts, where frequent input and practice are critical for developing communicative competence. The alignment between learning objectives, activities, and assessment within the module also exemplifies Biggs' constructive alignment, ensuring that improvements in test scores reflect genuine learning gains rather than test familiarity.[28] Consequently, *Talaby* represents a pedagogically grounded mobile learning product capable of addressing motivational and cognitive barriers in secondary-level Arabic education.

Conclusion

This study demonstrates that the Android-based instructional module *Talaby* was systematically developed through the ADDIE model, encompassing analysis, design, development, implementation, and evaluation stages. The validation results from both media and content experts indicate that the module meets the feasibility standards for instructional use, with strong alignment to curricular requirements and satisfactory technical quality. The implementation findings further reveal that the module supports engaging and learner-centered Arabic language instruction, as reflected in positive student responses and increased classroom participation. Despite certain technical limitations, such as platform dependency and limited interactive features, *Talaby* shows considerable potential as an innovative digital learning resource for secondary-level Arabic language education.

In terms of effectiveness, the findings provide empirical evidence that *Talaby* significantly improves students' learning outcomes. The results of the paired-sample t-test confirmed a statistically significant difference between pretest and posttest scores, indicating that the module effectively enhances students' academic achievement in Arabic language learning. These results highlight the value of integrating Android-based digital modules into language instruction to support active learning and improve learning performance. Future research may focus on expanding the module's platform compatibility, enriching interactive features, and examining its long-term impact across diverse educational contexts.

[28] J. Biggs, "Constructive Alignment in University Teaching"; Suhendi and ., "Constructivist Learning Theory: The Contribution to Foreign Language Learning and Teaching."

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