INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

OPEN ACCESS JOURNAL

Vol 12, Issue 3, (2023) E-ISSN: 2226-6348

Development of a Mobile Learning App for the Arabic grammar course for Third-Intermediate Students in Saudi Arabia

Areej Albassam, Dr. Rozniza Zaharudin

School of Educational Studies, Universiti Sains, Malaysia

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v12-i3/19202 DOI:10.6007/IJARPED/v12-i3/19202

Published Online: 29 September, 2023

Abstract

This research investigates the integration of mobile phones as a vital component in students' academic lives, highlighting their role in facilitating access to diverse information sources and fostering positive outcomes in terms of academic achievement and success. Specifically, the research explores the use of mobile learning technology in the educational process, emphasizing its effects on students' enjoyment of learning, motivation for learning, and overall educational attainment. The mobile content development process is outlined, comprising three fundamental stages: Design, Develop, and Publish. Each stage encompasses its own workflows, allowing for the utilization of various methods and tools. The research adopts the ADDIE model to design and develop a mobile learning application focused on improving students' achievement and motivation in learning Arabic grammar. The ADDIE model, an acronym for analysis, design, development, implementation, and evaluation, is employed to guide the progress of each phase, with continuous feedback playing a pivotal role in informing the development of the application. The content developed is tested and evaluated by students, taking their opinions into consideration. The ultimate aim of this research is to present a model that can be utilized as a framework for future studies and developments in the field of mobile learning technology.

Keywords: Mobile Learning, Academic Achievement, Motivation, Addie Model, Arabic Grammar.

Introduction

The Arabic language currently faces significant challenges, with users struggling to accurately reproduce even its simplest forms. This linguistic degradation is evident in the speech and writing of students, which often contain grammatical mistakes (Al-Ahwal, 2018). Numerous studies have confirmed the weaknesses in Arabic language usage among learners in Saudi Arabia, particularly among intermediate school students aged twelve to fifteen (Al-Ahwal, 2018; Al-Salami, 2018; Al-Otaibi, 2020; Abdo, 2020; Al-Zahrani, 2020). It is evident that students in Saudi Arabia exhibit weak grammatical skills, low learning motivation, and poor academic achievement in Arabic grammar.

Mastering the grammatical rules is crucial for learning the Arabic language, as they serve as the foundation for understanding and mastering various aspects of the language. These rules

prevent speakers from making errors in speaking and writing, providing them with accurate tools to refine their language skills. Failure to observe these rules results in a fragmented language devoid of coherence (Al-Mahi, 2015).

The traditional method of teaching Arabic grammar in Saudi Arabia revolves around teaching the curriculum, its structure, and functional meaning, and applying these rules in different texts.

To enhance the teaching of Arabic grammar, it is necessary to diversify teaching methods, tailor them to the subject matter, and employ strategies that actively engage students, placing them at the center of the educational process (Al-Ahwal, 2018).

Reviewing the literature and learning strategies, it is evident that the mobile learning strategy has been found to be effective for language learning.

Educational experts have emphasized the potential of mobile learning techniques to enhance education, creating an environment that fosters motivation, effective learning, and positive attitudes towards the subject (Alobekan, 2016).

The mobile devices have experienced widespread adoption, with some countries having more mobile phones than their total population. Within the realm of education, mobile devices have quickly gained popularity among learners (Al-Dahshan, 2013).

Numerous educational studies have confirmed that integrating mobile learning technology into the educational process yields positive outcomes, such as increased enjoyment of learning, motivation, and academic achievement, particularly in language learning contexts (Shuib et al., 2015; Khodi, 2015; Huang et al., 2016; Wu and Huang, 2017; Kuimova et al., 2018; Wijaya et al., 2018; Yahaya et al., 2019; Lai et al., 2020; Rahimi and Oveisi, 2020; Miranda et al., 2021; Ghani, 2022).

When exploring existing applications for teaching Arabic grammar, there is a noticeable lack of comprehensive options that align with the Saudi curriculum. Only a few applications exist, and they do not cover the entire curriculum. Consequently, the researcher became interested in designing and developing a mobile application to improve achievement and motivation in learning Arabic grammar.

Therefore, this study demonstrates the successful development of a mobile application for teaching Arabic grammar that offers an interactive and engaging learning environment. The careful consideration of the Saudi curriculum and the needs of the students ensured that the content was relevant and aligned with the desired learning outcomes.

The results of this study show that the app provides a comprehensive and informative resource for students, going beyond the limitations of traditional Arabic grammar books.

The design of the app, with its fun, simple, and minimalistic approach, catered to the target users, teenage students. The use of contrasting colors, purposeful visual elements, and custom-made icons created a visually appealing and unified experience. The integration of interactive features further enhanced engagement and interactivity.

This study can serve as a model for future works in the field of Arabic language learning. The successful development of this app highlights the potential of technology in enhancing the teaching and learning experience. By leveraging mobile applications and creating interactive environments, educators and developers can create effective tools for teaching grammar and other language skills.

Overall, this study may contribute to the growing body of research on the integration of technology in language education. The findings demonstrate the importance of incorporating interactive and engaging tools to enhance the learning experience and provide students with a more comprehensive understanding of Arabic grammar.

Design and development of the *Alwafida Alnahwia* Mobile App

The mobile app, (*Alwadifah Alnahwia*), was created following the principles of the ADDIE model. ADDIE stands for Analysis, Design, Development, Implementation, and Evaluation, and serves as a comprehensive framework for the creation of effective instructional materials. The ADDIE model offers several advantages, including rapid implementation and prototyping, cost-effectiveness through flexible adjustments during the development process, and systematic implementation of design principles. By emphasizing evaluation at each stage, the model prevents costly late-stage redesigns by ensuring that the final program is thoroughly tested. The model also places great importance on collecting data and feedback, ensuring that the needs of key stakeholders are consistently addressed during material creation and strategy development (Branch, 2009).

First: Analysis phase

The analysis phase is of utmost importance during the development of the (Alwadifah Alnahwia) mobile app. In this phase, the target group, consisting of Saudi female students, was thoroughly analyzed based on their abilities, knowledge, and skills. Additionally, their prior knowledge of mobile learning and expectations regarding learning through this method were taken into consideration. The analysis phase also encompassed content analysis and needs analysis, which involved administering a questionnaire to users to assess the suitability of the developed modules.

Needs Analysis

Needs analysis, as described by Nation and Macalister (2019, p.24), is an essential step in the development of effective learning modules. It aims to identify the real demands of learners and focuses primarily on the course's objectives and content. By conducting a needs analysis, the course ensures the inclusion of relevant and useful learning content.
The current phase of the study aimed to uncover the specific needs of students in relation to Arabic grammar learning modules. A total of 43 Saudi female students participated in the study. Data were collected through a questionnaire consisting of 23 items. The students used a five-point Likert scale to indicate the extent to which they agreed or disagreed with statements regarding the need for mobile learning modules in the classroom, the approaches required for learning Arabic grammar, and the learning materials. The collected data were quantitatively analyzed using the percentage formula.

The need for mobile learning modules in the classroom (Daud et al., 2021).

Num	**Items**	**1**	**2**	**3**	**4**	**5**	**Sum**	**Mean**	**S. D**
		f	***F***	***f***	***f***	***f***			
		%	**%**	**%**	**%**	**%**			
1	I would love to access materials anytime and anywhere on my mobile device.	0	1	6	11	25	36		
		0	2.3	14.0	25.6	58.1	83.7	4.40	0.82

2	I would like to see mobile learning integrated into my classes.	0 0	0 0	0 0	17 39.5	26 60.5	43 100	4.60	0.5

Num	**Items**	**1** ***f*** **%**	**2** ***F*** **%**	**3** ***f*** **%**	**4** ***f*** **%**	**5** ***f*** **%**	**SUM**	**Mean**	**S. D**
3	I would like to be able to easily view learning materials on my mobile device.	0 0	1 2.3	3 7.0	13 30.2	26 60.5	39 90.7	4.49	0.74
4	I would like to be able to download mobile application that could help me study.	0 0	1 2.3	5 11.6	16 37.2	21 48.8	37 86	4.33	0.78
5	I would like to be able to take quizzes on my mobile device.	0 0	0 0	1 2.3	9 20.9	33 76.7	42 97.6	4.74	0.49
6	It would require less effort for me to learn on using mobile applications.	1 2 . 3	2 4.7	6 14.0	11 25.6	23 53.5	34 79.1	4.23	1.02
7	Learning using my personal mobile device would be easy because I am familiar with	0 0	0 0	1 2.3	7 16.3	35 81.4	42 97.7	4.79	0.47

	all its functions.								
8	If I could use mobile devices, I would be more motivated.	0 0	0 0	2 4.7	13 30.2	28 65.1	41 95.3	4.60	0.58

Results and Students' Reception to Mobile Application Use in Arabic Grammar Teaching and Learning

The results of the study indicate that the students were highly receptive to the idea of using mobile applications for teaching and learning Arabic grammar. The table displays that over 80% of the responses were positive. A significant majority of the students (90.7%) expressed their interest in accessing learning materials on their mobile devices. Additionally, 97.7% of the students believed that learning with their personal mobile devices would be easy due to their familiarity with the functions. Moreover, 90% of the students agreed on the practicality of mobile learning, allowing them to access materials, quizzes, and learning opportunities anytime and anywhere. These findings suggest that the use of mobile applications is essential for the learning process of Arabic grammar, as they provide both accessibility and valuable content for the students.

Analysis of Educational Content and Objectives

The educational content has been thoroughly analyzed, and general objectives have been formulated. These objectives are predetermined by the Curriculum Department in the Ministry of Education in the Kingdom of Saudi Arabia. The objectives include various aspects such as developing sound linguistic habits, promoting observation and logical thinking skills, fostering deduction, and reasoning abilities, using grammar effectively for understanding words and meanings, enhancing language skills in different linguistic situations, improving reading and comprehension abilities, and nurturing communication and dialogue skills among students. The overall aim is to enrich students' language proficiency, knowledge, and cultural understanding. These objectives also emphasize the preservation and transmission of human knowledge across generations.

In addition, specific behavioral objectives have been defined at the beginning of each learning unit, following Bloom's classification of cognitive objectives. These objectives focus on extracting and understanding specific elements from texts, formulating sentences, identifying different types of elements, and applying grammar and spelling rules in expression.

Target Group Analysis

The first step in the study was to analyze the profile of the students. The students' age range was between 14 and 15 years old. The pre-test results indicated a generally low level of understanding of Arabic grammar knowledge among the students. However, more than 90% of the students reported having prior knowledge and experience in using mobile phones, including accessing the internet and various applications. Furthermore, over 80% of the students had participated in mobile learning activities. When asked about their daily mobile device usage, 97.7% of the students identified their mobile phones as their primary device,

while only 2.3% used laptops. Android was the preferred operating system for 71.4% of the students, while the remaining 28.6% used iOS.

Second: Design Phase and Chunking Strategy

The design phase of the study focused on defining the methods and procedures for implementing the educational processes. The objectives of the educational content were established, and the content elements necessary to achieve these objectives were identified. The strategy of chunking was applied in designing the content of the mobile application. Chunking involves dividing information into smaller, logical segments to enhance processing and retention. This approach takes into consideration the limited capacity of working memory and aims to provide learners with manageable amounts of information. Each module of the application was structured into sequential segments to meet the specific learning needs of the students. Clear headings were used to organize the sections, visually separating them for easy navigation. The modules contain learning materials, activities, and assessments that correspond to specific topics and objectives. The assessments determine the achievement of learning outcomes, while the activities allow students to practice and reflect on the concepts and skills they have learned before attempting the assessments.

Educational Content Elements and Objectives

This step involved identifying the educational content elements and objectives necessary for learning and achieving desired outcomes. The analysis of these elements included attracting students' attention, familiarizing them with the learning objectives, reinforcing previous learning, guiding their learning process, activating their response, providing feedback, and facilitating retention and continuation of learning. The learning and interaction method in the application is designed as a series of specific educational activities arranged in a logical sequence to achieve the intended objectives. The learning process begins with individual learning, where students begin by reading explanations and examples and answering exercises that provide immediate feedback. The application aims to engage students and help them progress through the necessary steps to achieve the learning objectives.

The content element for learning objectives (My eternal language curriculum, 2022).

Modules	**Student learning outcomes**	**Learning objectives**
Situation	Distinguish the situation and its types and use it.	• The student extracts the situation from any text presented to her. • The student extracts the situation owner from any text presented to her. • The student formulates sentences containing the situation. • The student determines the types of situations.
Distinguishment	Knowing the distinguishment and its types and expressions.	• The student extracts the distinguishment from any text presented to her. • The student formulates sentences containing the distinguishment.

		• The student determines the types of distinguishment.
Exclusion	Knowing the exclusion, its types, distinguishing it and using it.	• The student extracts the exclusion from any text presented to her. • The student determines the types of exclusion. • The student formulates sentences containing the exclusion.
Adjectives	Knowing the adjectives, its types, distinguishing it and using it.	• The student extracts the adjectives from any text presented to her. • The student determines the types of adjectives. • The student will write sentences containing the adjectives.
Conjunction	Knowing the conjunctions and their meaning and the ability to distinguish between them.	• The student determines the types of conjunction. • The student writes sentences containing the conjunction.
Apposition	Knowing the apposition and its types and expressions.	• The student extracts the apposition from any text presented to her • The student determines the types of apposition. • The student writes sentences containing the apposition.

Module plan design

The design of the module plan involved the segmentation of sessions, from the introduction to the closing activities. Each session incorporated the use of mobile devices, aligning with the distinctive features of mobile learning.

Module plan

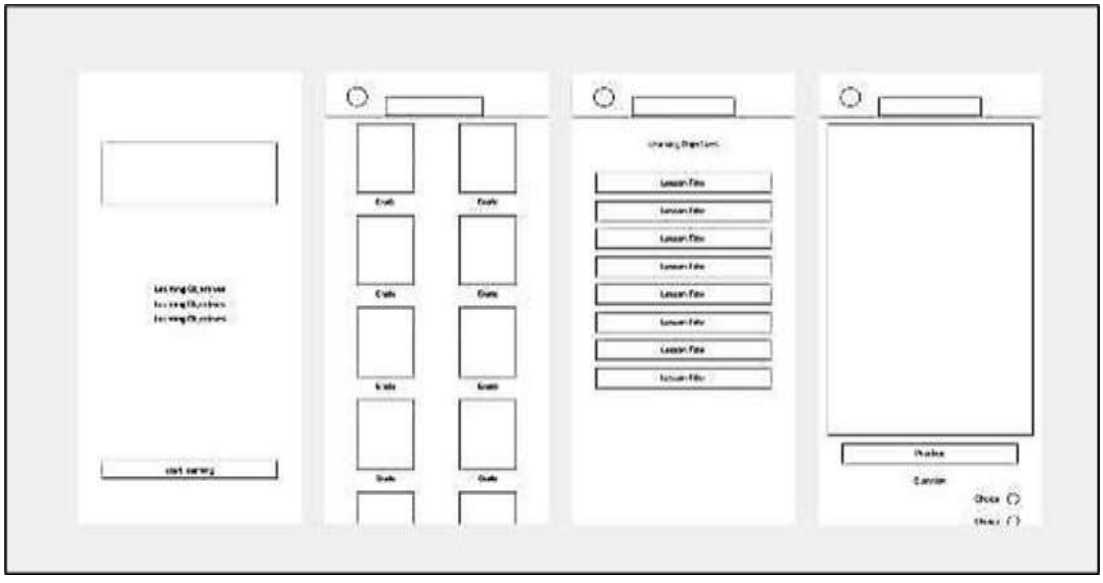
Sessions	**Activity**	**Time**
Introduction	Preparation to warming up the class. In this session the teacher will focus on the objectives.	5 minutes
Reading the content.	After being introduced to the module, the students will read the explanation of the rule and some examples by the app.	15 minutes
Quiz	After reading the explanation the students will answer a self-test to measure their recall and understanding about the module contents.	15 minutes
Collaborative quiz.	The teacher will instruct students to answer some interactive collaborative questions to measure their understanding.	15 minutes

Designing a learning storyboard for the application

The process involved the creation of a storyboard for the various components of the application. This storyboard served as a procedural map, presenting screens and their multimedia elements in a visually organized manner.

Storyboard

First unit			**Unit name**
Situation			**Lesson**
box-sizing: border-box; position: absolute; left: 3.08%; right: 2.82%; top: 17.65%; bottom: 14.45%; background: #FFFFFF; /* OutlineGray */ border: 1px solid #1B1B1B; /* ShadowStyle */ box-shadow: 5px 5px 1px rgba(0, 0, 0, 0.15); border-radius: 10px;			**Border code**
css			**Border style**
Cairo			**Font type**
situation			**Main subject**
Kind of situation			**Subtitle**
1- To know, distinguish and use the situation. 2- To know the types of situations. 3- To know the owner of the situation and to distinguish it. 4-To know the condition of the situation.	**Goals**	Lesson explanation	**Educational item type**
Unlimited time	**Show time**	4	**Slide number**
Back and forward buttons			**Graphic**
scroll animation			**Animation**
Back and forward buttons			**Buttons**



Designing Navigation Methods and Interface Interaction with the Application

The navigation methods and interface interaction with the application were carefully considered and designed to ensure optimal user experience. The chosen interface allows users to click on items or commands from a drop-down list for easy selection.

Formative Evaluation

To ensure the authenticity and quality of the content, the content and modules were reviewed by a group of referees specializing in Arabic language and education. The referees agreed with the design and organization of the content into small educational modules. They also confirmed that the content was suitable for the intermediate students.

Third: Development Phase

The development phase involves three tasks: drafting, production, and evaluation. During this phase, the learning outcomes are created and tested. The design plans and storyboards are transformed into actual educational materials. The mobile application was developed using Flutter, which is a mobile application SDK that allows for the creation of native applications on iOS and Android with native performance. Flutter is a cross-platform framework developed by the Google Chrome browser team and released in 2017.

Design and Development Process

The design and development process began by writing the app description and collecting all the content and materials to be included. The content was then organized in a Word file based on the desired format. A flow diagram illustrating the user's journey through the app was created, followed by a wireframe depicting app screens and necessary features and actions. Figma software was used for wireframing.

The visual design aimed to create a fun, simple, and minimalistic experience, using contrasting colors and a comic book style. Custom-made icons and vector graphics were created using Adobe Illustrator. The designs were imported into Figma to create a prototype, with each screen containing the necessary assets, buttons, and content. Buttons and icons were linked to their intended functions, and motion transitions between screens were animated.

The Figma design was then exported to Flutter for development. The developer utilized the design and prototype as a template, adding the app's content and interactivity. Flutter libraries provided the necessary functions, and custom code was written for core functionalities. A beta version of the app was created for testing and checking the design and layout. After successful testing, the app was built and exported as an .apk file to be shared on the app store and published. This allows users to easily download and install the app on their devices.

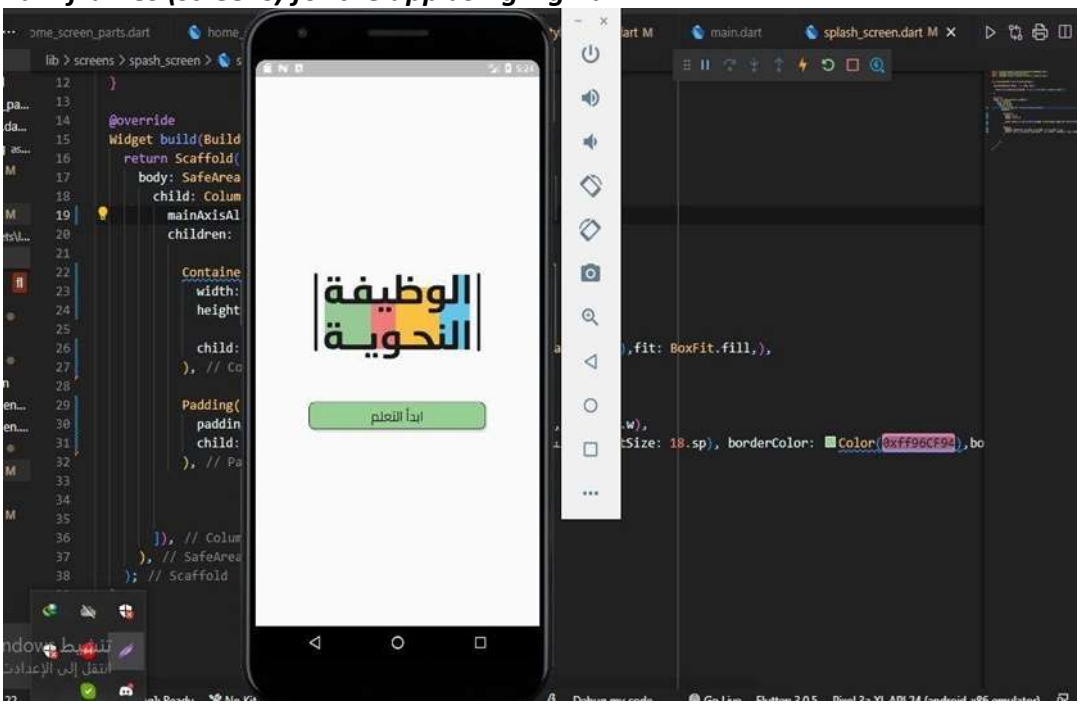
Throughout the development process, the focus was on maintaining visual consistency and unity. The design assets and elements were carefully crafted to ensure a cohesive and engaging user experience. The use of Figma and Flutter facilitated a seamless transition from design to development, as the design elements were easily translated into code snippets for the developer to reference.

After the development phase, the beta version of the app was extensively tested to identify any issues or problems with the design and layout. This testing phase ensured that the app was functioning as intended and provided a smooth user experience.

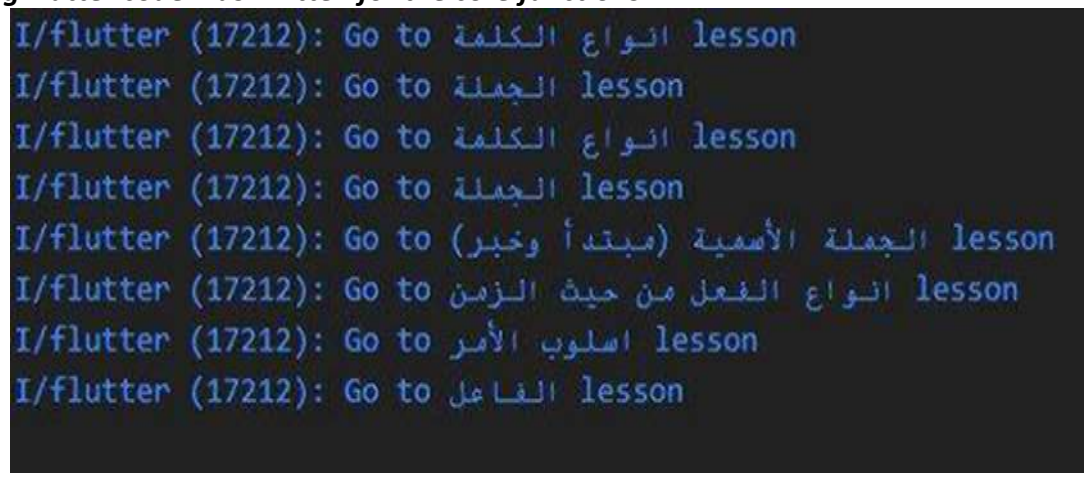
Once the app passed the testing phase and any necessary adjustments were made, the final build was exported as an .apk file. This file format allows for easy distribution and installation

on Android devices. The app can then be shared on the app store, making it accessible to a wide audience of users.

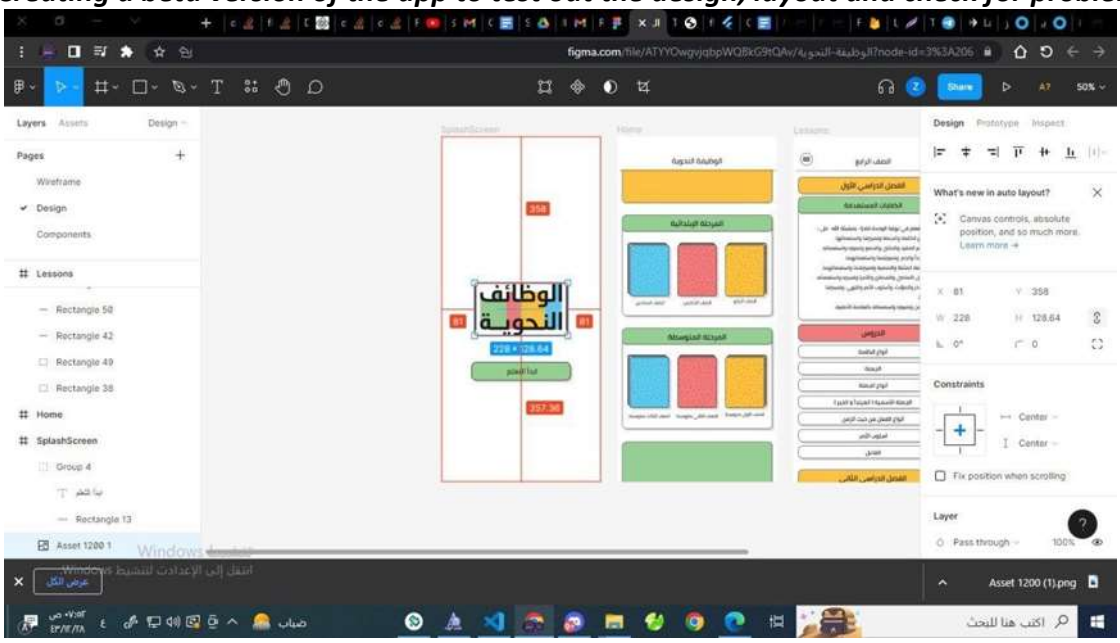
The main frames (screens) for the app using Figma



Using Flutter code was written for the core functions



Creating a beta version of the app to test out the design, layout and check for problems

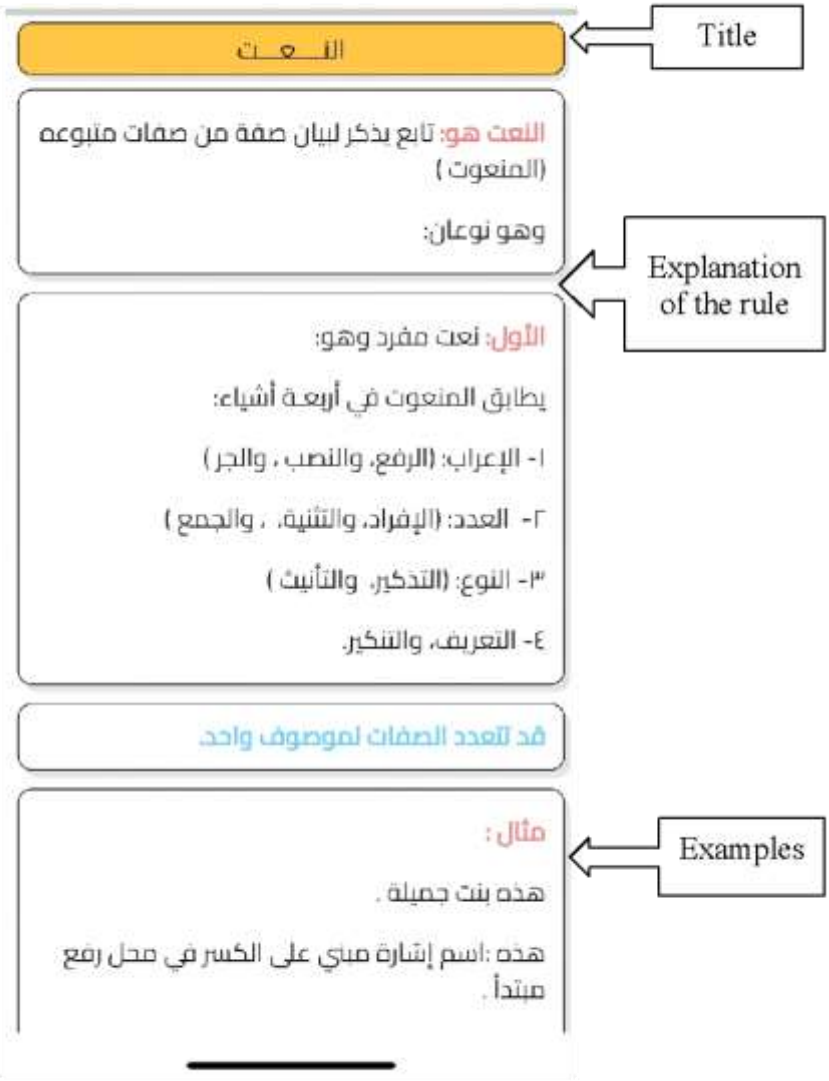


The design and development standards

(1) The course structure is well organized and easy to comprehend.
(2) Learners can easily navigate through the course, with quick access to the main menu and an exit option.
(3) Learners have unrestricted access to any section or content within the course.
(4) Learners are not required to click on each item to progress through the course.
(5) Learners can track their progress at any time, including sections completed and screens visited, allowing them to know their current position in the course.
(6) Consistent use of navigation icons and buttons throughout the course.
(7) Legible and consistent fonts (type, size, and color) are used throughout the course.
(8) The course effectively addresses the learning needs of the target audience.
(9) The content is logically structured.
(10) Concepts are clearly explained and supported by examples.
(11) The content is divided into self-contained sections, allowing for shorter learning sessions.
(12) The content aligns with the learning objectives and enables learners to achieve them.
(13) Assessments are incorporated throughout the course to reinforce learning and evaluate the learner's understanding of the content.
(14) The assessments are relevant and aligned with the learning objectives.
(15) Learners receive useful feedback when answering test questions (FAO, 2021, pp. 158-159).

Each module in the app begins with an explanation of the rule, followed by examples and a self-test to assess comprehension of the rule. Examples of the screens for the modules can be found in the accompanying illustrations.

Module



Self-test with the immediate feedback

Formative Evaluation

The researcher ensured the app's suitability by allowing it to be downloaded on personal devices without any advertisements. Students were not required to register an account or provide personal information. During the treatment stage, all necessary devices were provided in the classroom, and there were no issues with technology, such as network problems or device batteries. Additionally, the app's content, links, and activities were reviewed by a group of referees specialized in educational technology to ensure authenticity and provide feedback.

Fourth: Implementation Phase

The implementation phase refers to the actual delivery of instruction, whether in a classroom, lab, or computerized setting. The goal of this phase is to provide effective and efficient education. It is crucial to facilitate students' understanding of the material, help them achieve their goals, and ensure the transfer of knowledge from learning to goal setting (Muruganantham, 2015).

During the implementation phase, the designer or trainer must take an active role rather than a passive one. The designer's role becomes more important as this phase begins. To effectively deploy a product, developers must continuously analyze, redesign, and improve it. Leaving products and courses in their natural state can hinder program execution. Evaluation and necessary corrections are essential during the implementation phase for any product, course, or program to be effective. Active involvement of learners and trainers allows for on-the-fly changes to courses and programs to ensure effectiveness (Peterson, 2003).

The implementation phase involves the actual use of the learning experience. The classroom was equipped with devices for the experiment, and there were no technology-related issues. The app was installed on the devices, and students' proficiency in using the app correctly was assessed. Module time was scheduled to complete the required tasks within the specified timeframe.

Fifth: Evaluation Phase

The evaluation phase is a crucial part of the ADDIE process and encompasses various dimensions. It includes formative evaluation during the development phase, full implementation phase evaluation with the assistance of students and faculty, and pedagogical summative evaluation at the end of the course or program for improvement purposes.

Throughout the evaluation phase, the designer should assess whether the problem related to the training program was resolved, whether the objectives were achieved, and what the impact was. Changes necessary for future product offerings, courses, or programs should be identified. The evaluation phase should be an integral part of ongoing analysis and effective delivery of future courses and programs (Peterson, 2003).

The primary aim of the evaluation stage is to determine the achievement of objectives and identify future needs to enhance the effectiveness and success of learning.

The evaluation stage consists of formative evaluation and summative evaluation.

Formative Evaluation: This is the initial evaluation conducted during the development phase. It occurs during the study's implementation and monitors learning progress to allow for early intervention and improvement through activities, methods, and feedback.

Summative Evaluation: This evaluation takes place at the end of the program. A test is developed to measure the extent to which learning objectives were achieved through a pre-test and post-test. The results are recorded to ensure that the app's set objectives were accomplished through the developed learning application.

Results

The study began by examining the textbook used in schools, following the Saudi curriculum. The content was then divided into logical and sequential segments to meet the students' learning needs. Tests, scenario writing, and storyboarding were conducted as part of the development process.

The development phase commenced with writing the app description and gathering all the necessary content and materials. The content was organized in a file according to the desired format, divided by grade, semester, chapters, and lessons. A flow diagram was created to map out the user's journey. With the target users being teenage students, the app aimed to have a fun, simple, and minimal design, featuring contrasting colors and an enjoyable feel. Visual elements were purposeful rather than decorative, and custom-made icons were used to ensure visual unity. Graphic assets were then imported into Figma to create a prototype, with mainframes/screens such as the splash screen, home screen, lessons list screen, and lesson page screen. The Figma design was exported to Flutter, where the developer used it as a template to add content and interactivity. Flutter libraries provided the necessary functions for the app, and custom code was written for core functions. A beta version of the app was created for design layout testing and to identify any issues. After thorough testing, the app was exported as an apk file for distribution on the app store and publication.

References

Abdo, R., & Hiam, N. (2020). The impact of the use of electronic concept maps in understanding grammatical rules. Journal of Educational & Psychological Sciences, 4(3), 139–149. https://doi.org/10.26389/AJSRP.H260519.

Al-Ahwal, A. (2018). The effectiveness of using the inverted-learning strategy in developing grammatical skills and trend towards the syllabus among high-school students. Journal of the Gulf & Arabian Peninsula Studies, 44(171), 139–184.

Al-Dahshan, J. (2013). The use of the mobile phone in education between support and rejection. A working paper presented at the second scientific symposium on Higher Education Systems in the Age of Competitiveness. Kafr El-Sheikh, Egypt.

Alsulami, F. (2018). Effectiveness of a proposed program based on text grammar in developing grammatical thinking skills and reducing the anxiety of parsing among students of the Department of Arabic Language at Taif University. Umm Al-Qura University Journal of Educational & Psychological Sciences, 9(1), 59–109. Retrieved from https://uqu.edu.sa/jep.

Al-Obeikan, R., & Al-Dahmashi, N. (2016). Challenges of teaching technologies and programming of smart devices unit at high school in KSA. Journal of the College of Education - Al-Azhar University, (171), 453-478. https://doi.org/10.21608/JSREP.2016.48608.

Al-Otaibi, A. (2020). The efficiency of integrating strategy between generative learning and concept maps in developing grammatical skills among third-grade intermediate female students in Taif governorate. Journal of Educational & Psychological Sciences, 4(18), 17-45. doi:10.26389/AJSRP.N071219.

Al-Zahrani, K. (2020). The effectiveness of Bybee Instructional model in editing the alternative conceptions of some grammatical concepts for the sixth-grade students in Al-Baha region at Saudi Arabia. IUG Journal of Educational and Psychology Sciences, 28(2), 909-928. doi:10.33976/1443-028-002-039.

Branch, R. M. (2009). Instructional design: The ADDIE approach (Vol. 722). New York: Springer.

Dahl, O. (2019). Exploring end user's perception of flutter mobile apps. Retrieved from https://www.diva-portal.org/smash/record.jsf?pid=diva2:1480395.

Daud, N. A. M., Jalal, F. H., Zain, N. M., & Noh, N. (2021). A needs analysis on the development of a mobile learning (M-Learning) module for multicultural counselling. Journal of

Contemporary Issues in Business and Government, 27(2), 5230-5242. Retrieved from https://cibgp.com/article_10912_0a290fbe9d41a905cdb313f305836a5b.pdf.

FAO. (2021). E-learning methodologies and good practices. A guide for designing and delivering e-learning solutions from the FAO eLearning Academy (2nd ed.). FAO E-learning academy, Rome, Italy.

Ghani, M., Hamzah, M., Daud, W., & Romli, T. (2022). The impact of mobile digital game in learning Arabic Language at tertiary level. Contemporary Educational Technology, 14(1), 1-18. https://doi.org/10.30935/cedtech/11480.

Huang, C., Yang, S. J., Chiang, T., & Su, A. (2016). Effects of situated mobile learning approach on learning motivation and performance of EFL students. Journal of Educational Technology & Society, 19(1), 263-276. Retrieved from https://www.jstor.org/stable/jeductechsoci.19.1.263.

Khodi, A. (2015). Revisiting mobile assisted language learning in EFL writing classes. Enjoy Teaching Journal, 3(2), 1-6. Retrieved from https://bihe.academia.edu/EnjoyTeachingJournal.

Kuimova, M., Burleigh, D., Uzunboylu, H., & Bazhenov, R. (2018). Positive effects of mobile learning on foreign language learning. TEM Journal, 7(4), 837-841. https://doi.org/10.18421/TEM74-22.

Lai, C., Jong, B., Hsia, Y., & Lin, T. W. (2020). Integrating flash cards with narratives for mobile learning of English vocabulary. International Journal of Interactive Mobile Technologies (iJIM), 14(04), 4–16. https://doi.org/10.3991/ijim.v14i04.11723.

Malamed, C. (2013). Chunking information for instructional design. theelearningcoach.com.

Macalister, J., & Nation, I. P. (2019). Language curriculum design. Routledge.

Miranda, J., Dianelo, R., Yabut, A., Paguio, C., Cruz, A., Mangahas, H., & Malabasco, K. (2021). Development of insvagram: an English subject-verb agreement mobile learning application. International Journal of Emerging Technologies in Learning (iJET), 16(19), 219-234. https://doi.org/10.3991/ijet.v16i19.24071.

Muruganantham, G. (2015). Developing of E-content package by using ADDIE model. International Journal of Applied Research, 1(3), 52-54.

Peterson, C. (2003). Bringing ADDIE to life: Instructional design at its best. Journal of Educational Multimedia and Hypermedia, 12(3), 227-241.

Rahimi, E., & Oveisi, N. (2020). The impact of mobile teaching on learning and retention of nursing students in teaching English. Future of Medical Education Journal, 10(1), 8-12. https://doi.org/10.22038/FMEJ.2019.37286.1246.

Shuib, M., Abdullah, A., Azizan, S., & Gunasegaran, T. (2015). Designing an intelligent mobile learning tool for grammar learning (i-MoL). International Journal of Interactive Mobile Technologies, 9(1), 41-46. https://doi.org/10.3991/ijim.v9i1.4238.

Wijaya, I., Bakri, R., Wutun, A., Fitriani, F., & Mattoliang, A. (2019). The effectiveness of mobile learning-based android in learning English vocabularies. International Journal of Interactive Mobile Technologies (iJIM), 13(12), 226-235. https://doi.org/10.3991/ijim.v13i12.11167.

Wu, T., & Huang, Y. (2017). A mobile game-based English vocabulary practice system based on portfolio analysis. Journal of Educational Technology & Society, 20(2), 265-277. Retrieved from https://eric.ed.gov/?id=EJ1137353.

Yahaya, H., Sardi, J., Radzi, M., Abdelhamid, I., & Islam, F. (2019). Development of a mobile application in Arabic language learning in Malaysia: an overview. International Journal

Of Academic Research In Business And Social Sciences, 9(7), 1366–1376. http://dx.doi.org/10.6007/IJARBSS/v9-i7/6403.