



DEVELOPMENT OF AN E-WORKSHEET USING THE FORMATIVE APPLICATION FOR ARABIC LISTENING AND READING ASSESSMENT AT MADRASAH ALIYAH

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Abstract

The rapid advancement of digital technology in the Society 5.0 era demands a transformation in Arabic language assessment methods, which are still dominated by conventional written tests. This study addresses the urgent need for modern, interactive evaluation tools to enhance students' listening and reading skills at the Madrasah Aliyah level. The research aimed to develop an electronic student worksheet (e-worksheet) using the Formative application. This study employed a development research method, using the ADDIE model limited to the development phase. The needs analysis showed a moderate score of 75.25%, indicating the necessity for innovation. The product was validated by material experts (92%) and media experts (88%), both categorized as "very good." Minor technical revisions were made to improve user-friendliness. The results confirm that the e-worksheet increases accessibility, student engagement, and effectiveness in formative assessment. Compared to previous practices, this digital approach offers a more interactive and contextual learning experience. It is concluded that the e-worksheet is feasible and effective for use in Arabic language evaluation, with potential for broader application in other language skills.

Keywords: Electronic Worksheet, Formative Application, Listening and Reading Skills, Arabic Language Learning

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INTRODUCTION | مقدمة

In the era of Society 5.0, evaluation is required to undergo a more dynamic transformation, aligning with rapid technological advances and the evolving demands of 21st-century education. As a crucial component of the educational process, evaluation has shifted from being a mere tool for measuring achievement to becoming an integral part of holistic, contextual, and competency-based learning. Society 5.0, which emphasizes collaboration between humans and digital technology, encourages the education sector to adopt more adaptive, technology-driven approaches (Legi et al., 2023). However, despite students' growing familiarity with smartphones, Arabic language instruction remains dominated by lecture methods and written tests resulting in underdeveloped listening and reading skills.

To address this challenge, and in line with technological advancements, the use of digital media such as electronic student worksheets (e-worksheets) has begun to be adopted in Arabic language learning. E-worksheets offer advantages in terms of accessibility through digital devices and multimedia integration such as images, audio, and video which can enhance student engagement (Zhalila & Medika, 2024). Several studies have demonstrated that the implementation of technology-

based worksheets is effective in improving students' language skills, particularly in listening, reading, and writing (Farah, 2023). However, in practice, many teachers have yet to make optimal use of this technology in the evaluation process, especially for listening assessments that require the integration of audio-based questions (Azhar et al., 2025). Another barrier to the development of listening skills lies in the limited availability of practical and accessible audio-based test formats.

Various digital applications and platforms are now available, offering more interactive and engaging approaches to assessment. One such tool is the Electronic Learner Worksheet (e-worksheet), a digital learning medium accessible via laptops or smartphones. E-worksheets allow the integration of images, videos, and audio-based questions that can be answered directly through the platform, making the evaluation process more interactive and aligned with the learning preferences of digital-native students (Munawir et al., 2022). E-worksheets provide notable advantages, including high interactivity, flexibility, and ease of use through direct digital input. As a modern learning medium, the application serves a dual function: it acts both as a tool for teachers to deliver evaluations and as an adaptive learning resource that can operate independently of the teacher's physical presence (Fadlillah et al., 2023).

The Formative application emerges as an innovative evaluation tool that offers interactive features such as audio-visual questions, student account login, automatic scoring, time management settings, and flexible question formats, making it highly suitable for Arabic language learning. Recent research by (Muhamad et al., 2024) found that the Formative application is effective for evaluating listening and reading skills due to its adaptability in supporting various content types. The potential of this application in supporting listening and reading skills evaluations is also reflected in prior studies, which highlight that application-based media can enhance students' interest and comprehension of language skill assessments (Salsabila, 2023). In the context of Arabic language education, varied forms of assessment are essential, as language proficiency encompasses both receptive (listening and reading) and productive (speaking and writing) skills each requiring distinct and appropriate evaluation media.

Referring to these conditions, the development of an e-worksheet based on the Formative application is considered relevant as a modernization effort in Arabic language learning evaluation. This innovation is expected to serve as a more engaging and contextually appropriate tool for students in the digital era, designed in accordance with the principles of holistic formative evaluation to improve the effectiveness of Arabic language skills assessment at the Madrasah Aliyah level. Furthermore, it is envisioned as a modern evaluation model that meets the demands of 21st-century education namely, being inclusive, interactive, and technology-driven.

METHOD | منهج

This study employs a research and development (R&D) method using the ADDIE development model, which includes five stages: Analysis, Design, Development, Implementation, and Evaluation. However, the scope of this research is limited to the Development stage, as its primary objective is to develop and produce a valid e-worksheet media for evaluating Arabic listening and reading skills.

The steps of this research follow the ADDIE model and include the following stages:

1. **Analysis** – This stage begins by identifying problems based on observations conducted at the school. A needs analysis is then carried out to determine the requirements of both teachers and students in evaluating listening and reading skills.

2. **Design** – The structure and content of the e-worksheet are designed using the Formative application, incorporating interactive features to enhance user engagement.
3. **Development** – The product is developed and validated by subject matter and media experts. Revisions are made based on the feedback provided by validators.

The data collection instruments used in this research consist of:

- A student needs questionnaire
- Expert validation sheets

The questionnaire employed a Likert scale with the following score conversion:

Statement	Score
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

The percentage of responses was calculated using the following formula:

$$p = \frac{\text{Total Score Obtained}}{\text{Maximum Score}} \times 100\%$$

The percentage results were interpreted using the following criteria:

Percentage Range (x)	Feasibility Category	Remarks
85% < x ≤ 100%	Very feasible	No revision required
70% < x ≤ 85%	Reasonably feasible	Requires minor revision
50% < x ≤ 70%	Less feasible	Requires major revision
0% < x ≤ 50%	Not feasible	Cannot be used

A product is considered feasible or valid for implementation if it achieves a minimum score of more than 70%. In this study, the Formative application-based e-worksheet is categorized as feasible for evaluating Arabic listening and reading skills.

RESULT | نتائج

The product developed in this study is a digital evaluation medium in the form of an e-worksheet based on the Formative application, designed to support the assessment of listening and reading skills in Arabic language learning at Madrasah Aliyah Negeri 1 Palembang. This medium was developed as a practical and interactive evaluation tool, aligned with the needs of students in the digital era. The development process employed the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. However, in this study, the development was limited to the Development stage, as the primary focus was to produce a valid and feasible media product, as determined by expert validators' assessments. The stages of research and development undertaken in this study are presented as follows.

Analysis

The initial stage in the development of the e-worksheet involved conducting a needs analysis through data collection using interviews and questionnaires. Interviews were carried out with Arabic language teachers at Madrasah Aliyah Negeri 1 Palembang, while questionnaires were distributed in printed form to grade X students at the same institution. The results of the needs analysis are presented below.

Interview results

The needs analysis was carried out through interviews conducted on January 13, 2025, with the Deputy Head of Curriculum to obtain information regarding challenges in Arabic language assessment at Madrasah Aliyah Negeri 1 Palembang. In addition, interviews were held with Arabic language teachers to identify obstacles in the assessment of listening and reading skills among Grade X.1 students at the same madrasah.

The interviews revealed several key issues: (1) most students in Grade X.1 have limited mastery of Arabic vocabulary; (2) students' reading skills remain low, as evidenced by their difficulties in comprehending questions based on Arabic texts; (3) the assessment of listening skills is still limited and generally conducted through traditional written tests, with audio-based items rarely utilized; and (4) students face challenges in answering listening and reading assessment tasks, largely due to differences in educational backgrounds and their limited vocabulary proficiency.

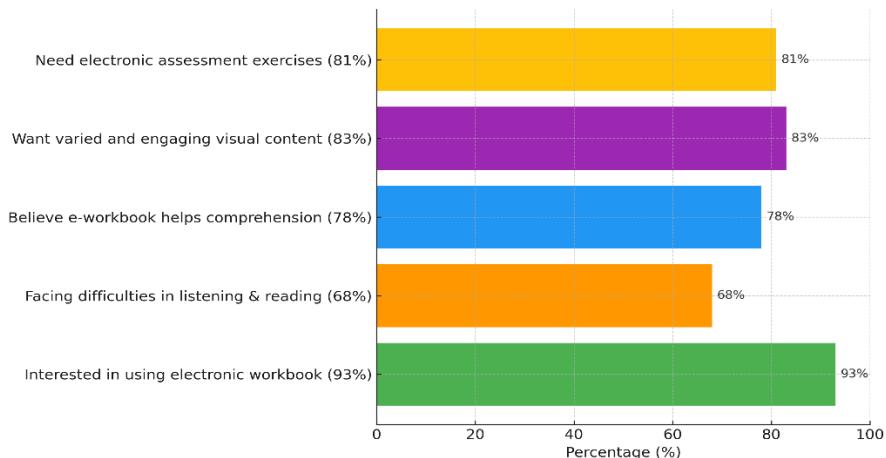
Questionnaire results

The needs questionnaire was administered on January 13, 2025, with the aim of identifying students' needs in the assessment of listening and reading skills and confirming the findings from the previous interviews. The instrument was distributed to 33 students in Grade X.1 and consisted of 20 items presented in the questionnaire.

No.	Description	Questionnaire Score
1.	The evaluation of Arabic language learning plays a crucial role in enhancing students' competence.	93
2.	Listening and reading skills in Arabic are still regarded as challenging aspects for students.	53
3.	The learning process remains largely dominated by the use of textbooks.	68
4.	Arabic language teachers have begun to utilize projectors in conducting learning evaluation activities.	42
5.	Instructional media are employed by teachers to support the teaching and learning process.	81
6.	Most students have limited proficiency in Arabic vocabulary.	72
7.	Students recognize the need to improve their Arabic listening and reading skills.	92
8.	Some students are still unable to fully comprehend Arabic texts accurately and correctly.	63
9.	The purpose and meaning of Arabic texts, whether heard or read, are not yet fully understood by students.	55
10	Students often seek assistance from teachers or peers when they encounter difficulties in understanding practice questions.	86
11.	Difficulties are still commonly experienced when answering questions related to Arabic listening and reading skills.	71
12.	Some students have already used media to evaluate their listening and reading skills.	69
13.	Students express interest in practice questions delivered through evaluation media.	82
14.	Students recognize the need to improve their Arabic listening and reading skills.	84
15.	Some students are still unable to fully comprehend Arabic texts accurately and correctly.	84
16.	The expected media is one that offers varied and engaging audio and visual features.	82
17.	Students prefer evaluation media that can be accessed both inside and outside the classroom.	85
18.	The ideal media is expected to provide clear audio and visuals that align with students' needs.	85
19	Most students express a preference for evaluation media in the form of applications.	77
20.	The demand for application-based evaluation media for listening and reading skills is relatively high.	81
	sum	1505
	average	75,25

Based on the questionnaire results, the majority of students demonstrated strong enthusiasm for digital-based assessment innovations. A total of 93% of respondents expressed interest in

participating in Arabic language assessments using electronic workbooks. However, 68% of students reported continued difficulties in listening and reading skills, highlighting the need for further intervention in the learning process. Additionally, 78% of students believed that the use of electronic workbooks could assist them in better understanding Arabic listening and reading assessment tasks. Moreover, 83% of students expected e-assessments to feature varied and engaging visual content, while 81% indicated the need for electronic assessments specifically designed to strengthen their listening and reading skills. These findings are presented in more detail in Graph 1:



(Survey results on students' needs for Arabic listening and reading assessment media)

The graph illustrates the percentage of students who expressed interest in using electronic workbooks, reported difficulties in listening and reading skills, and conveyed their expectations regarding digital-based evaluation media.

Design

Following the needs analysis conducted through interviews and questionnaires, the next stage involved designing a product in the form of an e-worksheet using the Formative application platform. The design process began with the identification of learning objectives and alignment with the independent curriculum, followed by the development of workbooks whose topics were adapted from the Arabic textbooks used in Grade X.1.

Design of Learning Outcomes and Objectives

Following the needs analysis conducted through interviews and questionnaires, the next stage focused on designing a product in the form of an e-worksheet using the Formative application platform. The design process began with identifying the learning objectives and aligning them with the independent curriculum, followed by the development of workbook content adapted from the Arabic textbooks used in Grade X.1.

Material Design

The materials in the digital workbook are structured around topics relevant to the independent curriculum, adapted to meet the needs of Arabic language teachers at the Madrasah Aliyah level. The learning content is designed to enhance students' listening and reading skills and is organized into three main chapters: Introductions, Family, and School. Each chapter includes vocabulary lists, dialogues presented in both text and audio formats, and practice exercises. The design of the materials takes into account cultural, social, psychological, and linguistic dimensions

to ensure that the content is contextualized and easily accessible to learners. The structure of the materials in the Formative application is divided into the following three main components

The materials in the Formative application are divided into the following three main components: (1) vocabulary and grammar, (2) listening materials, and (3) reading materials. The vocabulary and grammar section is structured to support students' comprehension in both listening and reading activities. The preparation of these materials draws on several reference sources, including the Grade 10 Arabic Language Book by Hassan Saifallah, instructional videos from the learning together with Zakaria YouTube channel, and the Junior Arabic Language Book.

Evaluation Design

The evaluation design in the developed media is not only adapted to learning needs but also intended to address the challenges identified in previous media. While the evaluation remains formative in principle, there are notable differences in terms of technical features and student engagement between the printed book version and the application. In the previous media, listening skills were assessed through audio accessed by scanning a barcode using a third-party application, a process that posed difficulties for students, particularly those with limited devices or unstable internet connections. In contrast, within the Formative application, audio materials can be accessed directly with a single click, making it easier for students to engage with listening skills evaluation tasks. In the case of reading skills, the evaluation in printed books tends to be monotonous, as it is presented solely in the form of extended texts without visual support, which reduces students' interest and motivation. Through the development of the application, the evaluation of reading is designed to be more interactive, featuring visual illustrations that support students' comprehension of the reading context.

This evaluation design is intended to ensure that the developed e-worksheet functions not only as a training tool but also as a medium for active and enjoyable learning reflection. Key aspects such as accessibility, student engagement, and alignment with the characteristics of listening and reading skills serve as the primary principles in designing the evaluation within the Formative application. These details are presented more specifically in Table 2.

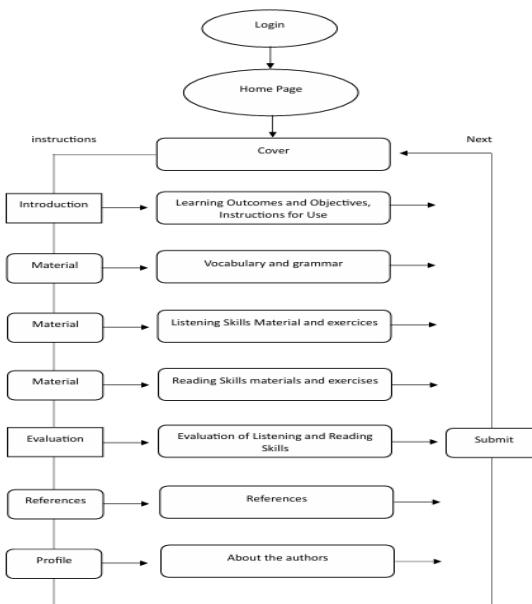
Aspects	Print Book Evaluation (Before)	Formative Application Evaluation (After)
Type of Evaluation	Uses barcodes and requires additional applications for access.	Allows direct audio access with a single click within the application.
Audio Access for Listening	Presents long texts without supporting visual aids.	Presents reading texts accompanied by illustrative visuals.
Reading Assessment Design	Features a simple and monotonous design.	Offers an interactive, colorful, and user-responsive design.
Display and Visual Design	Encourages passive learning, with reading and answering tasks that lack immediate feedback.	Facilitates active learning with instant feedback and repeatable exercises.
Student Engagement Level	Requires the use of separate printed books and scanner applications.	Operates through a single, integrated application platform.
Technology Requirements	Limited in scope, measuring only the final outcome of student performance.	Supports both process and outcome-based assessments through continuous evaluation.
Alignment with Learning Objectives	Uses barcodes and requires additional applications for access.	Allows direct audio access with a single click within the application.

Based on the data presented, it can be concluded that the evaluation design developed in the e-worksheet based on the Formative application offers several advantages over conventional

media. The evaluation is more accessible, visually engaging, and better aligned with the characteristics of listening and reading skills, which require contextual audio and visual support. With a design that emphasizes accessibility, interactivity, and the application of continuous formative assessment principles, this media is expected to enhance learning effectiveness and increase student engagement in Arabic language learning.

Menu Structure Design

The structure of the learning media is designed using a flowchart to represent the program sequence. This design outlines the progression of subject matter content implemented in the Formative application-based e-worksheet. Each stage in the flowchart reflects a systematic learning process, beginning with topic selection, followed by material presentation, and concluding with the evaluation of listening and reading skills.



(Chart 1: Menu structure design)

App Display Design

The developed online workbook features materials, practice exercises, and illustrations arranged in an attractive and structured layout to enhance student engagement and interest in learning. The organization of these elements is intended to facilitate students' understanding of each subtopic and to encourage active participation in the learning process. The resulting product is an application that can be accessed via mobile devices and computers, designed to support Arabic language learning, particularly in listening and reading skills. Each interface within the application is equipped with interactive buttons to facilitate navigation and ease of use for both students and teachers. The main features of the application include:

The main features of the application include	Descriptions
Home Page	Provides class selection menus, subject icons, and login features.
Listening Skills Materials	Presents conversations in audio format, accompanied by illustrations and short exercises.
Reading Skills Materials	Contains reading texts supported by illustrations and comprehension exercises.
Listening Skills Assessment	Uses audio combined with multiple-choice questions.
Reading Skills Assessment	Presents illustrated texts with vocabulary highlighting features and multiple-choice questions.
Automatic Feedback	Provides immediate feedback on correct and incorrect answers.

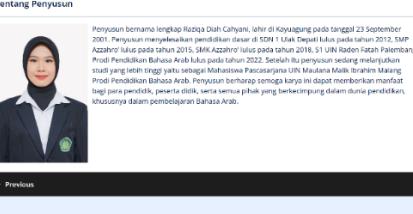
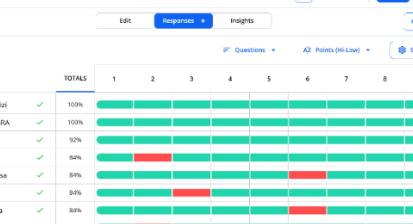
This design is expected to foster a more interactive, engaging, and effective learning experience for users in enhancing their Arabic listening and reading skills.

Development

Following the completion of the design stage, the process advanced to the development phase, during which the product was constructed based on the previously designed framework using the Formative application. At this stage, product feasibility was tested through a validation process involving subject matter experts and instructional method experts. The purpose of the validation was to ensure the alignment of content, methodology, and technical aspects of the media with the intended learning objectives. The initial product was subsequently revised in accordance with the feedback, critiques, and suggestions provided by the validators, resulting in a clear distinction between the original version and the improved product.

Development of the Formative Application Based E-Worksheet

No.	Visualization	Description
1.		Home Page
2.		Cover Page
3.		Introduction
4.		Vocabulary and Grammar
5.		Listening Skills

6.		Reading Skills
7.		Assessment
8.		User Profile
9.		Evaluation Results

Validation

In this study, the developed product is an electronic workbook designed for the assessment of listening and reading skills, created using the Formative application platform. Prior to classroom implementation, the product underwent validation by subject matter experts and instructional media experts to determine its level of validity. The validation process aimed to ensure that the material was appropriate for use in assessing listening and reading skills, while also serving to obtain expert feedback. A structured questionnaire was employed as the validation instrument to evaluate aspects such as content accuracy, visual design, and practical feasibility. In addition, the validation stage provided valuable input and suggestions for revising and refining the electronic workbook prior to further field testing.

Material Expert Validation

The developed materials were submitted to a subject matter expert for evaluation and feedback. The validation was conducted by Dr. Nurul Mufidah, M.Pd., a lecturer in the Department of Arabic Language Education, Maulana Malik Ibrahim State Islamic University, Malang. The validation process employed a structured questionnaire designed to assess the content's appropriateness, the integration of materials, and their alignment with the stated learning objectives. The results of the material expert validation are presented as follows:

Indicator	Category	Number
The alignment of listening and reading skills exercises with the intended learning achievement indicators.	Good	4
The integration between learning materials and the listening and reading exercises presented in the e-worksheet.	Very good	5
The appropriateness of the practice questions with the established learning objectives.	Good	4
The usefulness of the presented vocabulary in supporting students' understanding of the exercise items.	Very good	5
The coherence and systematic organization of the practice exercises.	Very good	5
The clarity of the exercise presentation in facilitating students' comprehension of listening and reading tasks.	Very good	5
The use of simple and accessible language in listening and reading exercises.	Good	4
The integrative nature of the exercises, linking listening and reading skills in a cohesive manner.	Very good	5
The appropriateness of the difficulty level of the exercises with the learners' age characteristics.	Good	4
The cultural relevance of the exercises in relation to the students' local context, to enhance the relevance of learning.	Very good	5
TOTAL	Very Good	92%

Media Expert Validation

The developed product was submitted to an instructional design expert for evaluation and feedback. The validation was conducted by Dr. Abdul Muntaqim Al Anshory, S.Hum., M.Pd.I, a lecturer in the Department of Arabic Language and Literature at Maulana Malik Ibrahim State Islamic University, Malang. The validation process utilized a questionnaire designed to evaluate the instructional design aspects of the product. The results of the instructional design validation are presented as follows:

Indicator	Category	Number
The attractiveness of the main menu display design.	Good	4
The harmony of color composition in the media interface.	Good	4
The appropriateness of font size and type used in the media.	Good	4
The clarity and organization of navigation buttons.	Very good	5
The overall ease of use of the media.	Very good	5
The clarity of audio playback in the media.	Very good	5
The accuracy of audio in relation to the accompanying text.	Very good	5
The clarity and relevance of images or illustrations presented.	Good	4
The readability and clarity of written text in the media.	Good	4
The visual appeal of color usage across the media interface.	Good	4
TOTAL	Very Good	88%

Revised

This product received a "very good" rating with the statement that it can be used in experiments with improvements, with a few conditions, namely:

No.	Expert	Revised aspects	Suggestions
1.	Material	Symbol of Listening Skills	Addition of symbols to indicate listening activity sections.
2.		Writing Rules	Improvement of writing structure to align with appropriate language conventions.
3.		Text Animation/Movement	Incorporation of movement or animation in reading texts to enhance visual interaction.
4.	Media	Font Size	Adjustment of font size in specific sections to improve readability.
5.		Workbook Title/Cover	Inclusion of the phrase "Listening and Reading Skills" on the workbook cover to clarify its focus.

Final Product

The final product resulting from the research and development of the Formative application-based e-worksheet was declared feasible for use in evaluating listening and reading skills.

DISCUSSION | مناقشة

The results showed that the development of the Electronic Student Worksheet (E-Worksheet) formative application made a positive contribution to enhancing the effectiveness of listening and reading skills assessment among Madrasah Aliyah Negeri students. Validation by material and media experts indicated that the product meets the eligibility criteria with a rating of 'very good,' although some technical improvements are required before classroom implementation. These findings are consistent with previous research, which states that application-based learning media can significantly increase students' interest in learning. (Restu Kurnia & Titin Sunaryati, 2023).

In the context of listening skills, the formative application offers easy access to audio directly, without the need for additional applications, thereby overcoming the obstacles previously encountered with printed book-based media. This supports findings that highlight the importance of integrating text and audio to enhance students' comprehension (Riva'i et al., 2020). In addition, the reading evaluation design, presented with supporting illustrations, proved to be more engaging and effective in helping students understand the context of the reading, as revealed by Lestari and Setyarsih in the development of science literacy-based formative assessment instruments. (Lestari & Setyarsih, 2020).

The questionnaire results showed that the majority of students expressed interest in conducting assessments using electronic media and believed that this medium helped them better understand listening and reading skills questions. These findings corroborate the results of research conducted by Salam and Adam, who found that the use of application-based media can increase students' confidence and comprehension in addressing language skills questions. (Salam & Adam Mudinillah, 2021). However, this development also has its limitations. The formative application still requires a compatible mobile device or computer, as well as a stable internet connection during the initial installation or update stages. This poses a challenge for schools located in areas with limited ICT facilities, as noted by Zaini in relation to digital disparities within Indonesia's educational environment. (Miftah, 2022). In addition, feedback from the validators suggested several technical improvements, such as adding symbols for listening activities and adjusting the font size to enhance user-friendliness.

Implications of this study suggest that the development of this E-Worksheet can serve as an alternative model for assessing Arabic language skills that is more modern and adaptive to advances in educational technology. Designed based on the principles of formative evaluation, this media functions not only as a tool for measuring skills but also as an engaging medium for reflective learning among students. In the future, similar developments could be extended to cover speaking and writing skills, thereby providing a more comprehensive assessment of Arabic language proficiency.

CONCLUSION | خاتمة

The development of the Electronic Student Worksheet (E-Worksheet) formative application to assess listening and reading skills in Arabic language learning has undergone validation and revision stages based on input from material and media experts. After improvements were made, the product was declared feasible and met the criteria for classroom testing. The E-Worksheet offers advantages in terms of accessibility, interactivity, and student engagement, which were previously obstacles in conventional printed media. Validation results indicate that the materials and media align with learning outcomes, evaluation objectives, and student characteristics, thereby potentially enhancing the effectiveness of formative evaluation in Arabic language learning at the Madrasah

Aliyah level. It is also recommended that broader trials be conducted at various educational levels to ensure the product's effectiveness in a more comprehensive and sustainable manner.

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