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Development of android application-based learning media for English subjects

Andi Asmawadi[1], Pattaufi[2], Abdul Hakim[3], Nurhikmah H.[4]
[1,2,3,4] Universitas Negeri Makassar, Kota Makassar, Indonesia
andighaziya@gmail.com[1], pattaufi@unm.ac.id[2], abdul.hakim7308@unm.ac.id[3], nurhikmah.h@unm.ac.id[4]

ABSTRACT

The limited availability of interactive learning media and contextual learning resources, especially for English subjects that require audio-visual support such as language laboratories, forms the basis of this study. This research aims to develop Android-based learning media for seventh-grade English subjects at SMPN 5 Labakkang. This study employs the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The media was developed using PowerPoint and iSpring Suite, then converted into an APK file using Website 2 APK Builder. Validation was conducted by subject matter experts and media experts, with results indicating that the media is highly feasible. A trial was conducted with 20 students using pretests and posttests. The results showed a significant improvement in students' learning outcomes after using the media, with an average score increase of 27 points. In addition, both students and teachers responded positively regarding the ease of use and effectiveness of the media. This study concludes that the developed Android-based learning media are effective in improving students' understanding of English and can serve as an alternative interactive teaching resource for junior high schools.

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ABSTRAK

Keterbatasan media pembelajaran interaktif dan sumber belajar kontekstual, terutama untuk Bahasa Inggris yang memerlukan dukungan audio-visual seperti laboratorium bahasa. Tujuan penelitian untuk mengembangkan media pembelajaran berbasis Android pada mata pelajaran Bahasa Inggris kelas VII di SMPN 5 Labakkang. Penelitian ini menggunakan model pengembangan ADDIE yang terdiri dari lima tahap, yaitu Analyze, Design, Develop, Implement, dan Evaluate. Media dikembangkan menggunakan PowerPoint, iSpring Suite, dan dikonversi menjadi file APK menggunakan Website 2 APK Builder. Validasi dilakukan oleh ahli materi dan ahli media, dengan hasil validasi menunjukkan bahwa media tergolong sangat layak. Uji coba dilakukan pada 20 peserta didik melalui pretest dan posttest. Hasil penelitian menunjukkan adanya peningkatan signifikan dalam hasil belajar peserta didik setelah menggunakan media, dengan peningkatan skor rata-rata sebesar 27 poin. Selain itu, peserta didik dan pendidik memberikan tanggapan positif terhadap kemudahan penggunaan dan keefektifan media. Penelitian ini menyimpulkan bahwa media pembelajaran berbasis Android yang dikembangkan efektif meningkatkan pemahaman peserta didik dalam pembelajaran Bahasa Inggris dan dapat digunakan sebagai alternatif bahan ajar interaktif di sekolah menengah pertama.

Kata Kunci: *aplikasi android; bahasa Inggris; media pembelajaran; model ADDIE*

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INTRODUCTION

Education plays a key role in advancing national development, in accordance with the provisions of Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional, which emphasizes intellectual development, character formation, and national civilization. The era of globalization and the Fourth Industrial Revolution is driving educational transformation through the integration of technology, shifting learning approaches from conventional to digital. In Indonesia, the Merdeka Curriculum introduces a learning paradigm that focuses on students' needs, contextual relevance, and meaningful learning experiences. However, implementing this curriculum presents challenges, particularly in areas with limited educational facilities. English language learning in junior high school requires mastery of listening, speaking, reading, and writing skills, which necessitates multimodal learning media. To support the learning process, instructional media must serve as intermediaries (Nurhikmah *et al*., 2021).

Initial observations in June 2024 at SMPN 5 Labakkang indicated that 78% of students struggled to understand English-language materials using only textbooks, and 85% of educators reported an urgent need for interactive media. The absence of a language lab and the scarcity of audio-visual resources hinder the development of listening and speaking skills, which are crucial components of language learning (Pattaufi & Arnidah, 2019). Additionally, educators face obstacles in creating innovative media due to limited technical skills. Previous research has shown that implementing interactive PowerPoint-based learning media in Economics lessons is effective in increasing student engagement and learning outcomes through attractive visuals and audiovisual features (Damayanti & Sukirno, 2025). Furthermore, the research develops a Visual Basic Application (VBA)-based learning medium in PowerPoint for studying set theory in mathematics (Yuliani *et al*., 2023). Other research has shown that Android-based learning media are effective in improving vocabulary skills and can also attract students' interest through appealing visuals and a child-friendly interface (Iswara *et al*., 2023).

Previous research has shown that technology can improve learning effectiveness. Furthermore, PowerPoint-based learning media have been shown to enhance students' understanding of the material. However, the media development uses only PowerPoint. Meanwhile, this research proposes an innovative approach by integrating Microsoft PowerPoint, iSpring Suite, and Web 2 APK Builder to create an Android application accessible to non-technical educators. The novelty of this research lies in the use of easy-to-master development tools, media design using PowerPoint and Spring Suite, which is then converted into an Android application with Web 2 APK Builder that can be accessed offline/online anywhere, as well as locally contextual content "Galang from Kalimantan" that is relevant to the Kurikulum Merdeka. The research aims to address the need to evaluate the Android-based learning media, their design, validity, practicality, and effectiveness in improving the English learning outcomes of seventh-grade students.

LITERATURE REVIEW

Educational Technology and Digital Learning

Educational technology is the study of the use of technology to improve the quality of learning. In the context of 21st-century learning, the use of digital media is increasingly important because it facilitates interactive and flexible learning. Digital learning also enables a more adaptive and integrated learning process through devices such as computers and smartphones (Thalib *et al*., 2025). Android-based digital learning media enable anytime, anywhere learning and can incorporate multimedia elements to support students' learning styles. Android devices account for 86.2% of the smartphone market, making them a suitable platform for developing mobile learning media (Astini, 2020).

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Android Learning Media

Android-based learning media have been developed in various contexts and have been shown to increase students' interest and learning outcomes (Putra & Salsabila, 2021). Research shows that Android applications that combine visual content, text, and audio provide a more enjoyable learning experience, particularly in English language learning (Prasetyo, 2017). The study developed an application using the ADDIE approach for English-language materials and found a significant improvement in students' scores (Mardiana *et al*., 2021). Another study developed an application that integrated text, animation, and interactive questions, with evaluation conducted through validity and practicality tests, demonstrating that the media are suitable for use, support independent learning, and improve learning outcomes (Humairah *et al*., 2020). The advantages of Android-based media lie in their ease of access, interactivity, and the ability to integrate features such as animations, quizzes, and audio for pronunciation. In this context, the media is developed using an application to generate HTML5, which is then compiled into an.APK file using Web 2 APK Builder. This approach offers practical solutions for educators in creating engaging and easy-to-use media in the classroom. Android-based learning media significantly improve students' vocabulary comprehension, while also offering a flexible and easily accessible learning experience (Mahardika, 2024).

Theoretical Foundation for Media Development

Media development must align with contemporary needs and learners' cognitive development (Malik *et al*., 2024). Cognitive and constructivist learning theories are the main basis for the development of digital media. According to Piaget, learning is an active process of constructing knowledge from students' prior experiences and cognitive structures (Masgumelar & Mustafa, 2021). The application of Self-Determination Theory (SDT) to mobile learning applications shows that meeting the needs for competence, autonomy, and social relatedness can increase intrinsic motivation and the sustainability of students' learning participation (Jeon, 2022). Multimedia-based learning, as outlined in Mayer's multimedia theory, enhances information retention and transfer when text, images, and sound are integrated (Fathoni & Sumaryati, 2024). Additionally, the importance of competence, autonomy, and connectivity in enhancing students' learning motivation is recognized. These components can be addressed through Android-based media that incorporate challenges and interactions tailored to learners' skill levels. The success of media development can be measured by user responses indicating its effectiveness (Ayuningtyas & Rinawati, 2020).

Relevant Previous Research

Previous studies have shown that Android-based applications can improve students' understanding and learning motivation. However, its approach has not yet integrated tools, such as iSpring Suite, and has not targeted English-language materials at the junior high school level (Latifa *et al*., 2020). Meanwhile, another study used the ADDIE model comprehensively and developed Android-based interactive media for English language learning. The results showed increased student scores and positive responses from educators, consistent with findings from this study (Mardiana *et al*., 2021). Furthermore, the researchers designed Android learning media using Lectora Inspire to provide buffer solution materials for an 11th-grade high school (Kurniawati & Afdina, 2023). Research indicates that Android-based media can enhance learning motivation and understanding of science concepts among elementary school students (Jatmiko & Nugroho, 2023). Furthermore, research indicates that Android-based media improves learning outcomes (Kartini & Putra, 2020). This medium is considered effective because it provides interactive content, enables students to learn independently, and significantly improves conceptual understanding.

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METHODS

This research and development study employs the ADDIE approach to systematically and adaptively support the development of technology-based instructional products. Here are the detailed steps.

1. Analysis Stage: data collection as a basis for creating media materials from the beginning, including interviewing educators, distributing questionnaires to determine student needs, analyzing materials, and analyzing student characteristics. Before initiating development activities, research data were collected through interviews to identify solutions and assess the needs of the target media.
2. Design Stage: Creating Android-based learning materials that can be tested using appropriate techniques and application integration, the researcher produces learning materials in the form of an Android-based application during the design stage. The steps taken were to develop a framework and design the application components. The application content components were completed using the independent curriculum learning resources after the learning media were finalized.
3. Development Stage: This is the testing of a product that is being developed. The testing stage aims to produce learning media that have been tested for quality and validity. Feedback from validators is used to refine the application and assess the practicality of the learning media. This research uses English language materials, media, and lecturers as validators.
4. Implementation Phase: testing the product in research that has already undergone evaluation by two validators, one who is an expert in content and materials, and the other an expert in design and media, as research subjects. The trial was conducted with English-language students and educators across several classroom sessions, and its implementation was adapted to the application's learning activities. During the trial, practicality was also assessed through the responses of students and educators.
5. Evaluation Stage: assessment of the quality of the Android Application media. The activities at this stage include conducting small-group trials to assess student learning outcomes by administering pretest and posttest evaluation questions.

The data analysis techniques in this study include content analysis of learning and descriptive analysis. Content analysis was conducted to formulate the objectives and flow of English language learning for Grade VII Phase D, in accordance with the Learning Outcomes, which served as the basis for developing Android-based media. Meanwhile, descriptive analysis was used to assess the validity, practicality, and effectiveness of the media, based on questionnaire data processed using the Likert scale and percentage criteria. Validity and practicality were determined through expert assessments, while effectiveness was assessed by comparing students' pretest and posttest scores using the percentage of students at the mastery level.

RESULTS AND DISCUSSION

Analysis Stage

The analysis phase used questionnaires to assess student and teacher needs, which were analyzed descriptively and qualitatively to inform the initial design of the learning media content (Adri et al., 2020). Interviews are used to gather in-depth feedback and suggestions from students regarding the developed media. This stage is conducted through interviews and the online distribution of questionnaires to students. The results of interviews with English language educators at SMPN 5 Labakkang revealed that the learning process remains teacher-centered and limited to textbooks, and that facilities such as language laboratories are not yet available, making it difficult for students to understand the material, particularly in listening skills. Educators expressed an urgent need for varied, interactive, Android-based learning media that would enable students to learn independently both inside and outside the classroom, and that would

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be equipped with materials, practice questions, audio, and discussion features to enhance students' interest and understanding.

Table 1. Description of Identifying Students' Needs for Learning Media

No.	Questions	Answers Percentage		
		Yes	Sometimes	No
1.	Have you ever experienced difficulties while learning English material?	17	2	1
2.	Did the teacher use textbooks during the English language learning activities?	15	4	1
3.	Does the printed English textbook make you happy to study?	9	8	3
4.	Have educators ever used teaching materials other than printed books in English class?	5	0	15
5.	Have you ever heard of Android application learning media or materials?	18	1	1
6.	The learning media will be equipped with materials, images, audio, and videos, and installed directly on your smartphone. Are you happy and excited to learn English using an app?	20	0	0
7.	Do you agree with learning English using an Android app?	20	0	0
	Total	**104**	**15**	**21**
	Percentage (%)	**74%**	**10,71%**	**15%**

Source: Research Data, 2025

Based on the results of the needs identification of students for the Android-based learning media product, with seven points available in **Table 1**, it can be concluded overall that the total score for the "yes" option is 104 with a percentage of 74%, the total score for the "sometimes" option is 15 with a percentage of 10.71%, and the total score for the "no" option is 21 with a percentage of 15%. Based on the results of the student needs analysis, both educators and students consider it very important to develop an Android-based learning media product as a resource and teaching material that complements the English language learning process in the classroom and aligns with available teaching modules. This condition provides an important basis for designing audiovisual media that is easily accessible on Android devices.

Design Stage

The next step is to design this Android application using Microsoft PowerPoint and iSpring Suite. The design is based on the previously created prototype and storyboard (Adeoye, 2024). This process leverages PowerPoint's creative capabilities and design tools to develop layouts, graphics, and other visual elements that align with the previous prototype and storyboard concepts. The quiz design in Ispring Suite is customized to meet the implemented needs and preferences, while also adhering to design principles that make the learning media application easier to understand and more engaging. The design of Android-based learning media serves as the foundation for subsequent implementation, ensuring that the final results align with the established expectations and objectives (Pramusita & Suryono, 2024).

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Figure 1. Android Learning Media Design
Source: Authors' Documentation, 2025

Figure 1 shows the display created using Microsoft PowerPoint and iSpring Suite. The developed material is Chapter 1, "Galang from Kalimantan," aligned with the learning objectives in the Kurikulum Merdeka Phase D. The content comprises text, illustrative images, audio listening, multiple-choice exercises, and a final evaluation. The initial prototype was created in PowerPoint format and then integrated with iSpring Suite to produce an interactive HTML5 format.

Development Stage

At this stage, the design is saved and published as an HTML5 file using the Ispring Suite page, and then exported as an Android APK using Web 2 APK Builder, so that it can be installed and accessed both online and offline on students' smartphones. Next, the development stage includes expert evaluation (Martatiyana *et al*., 2023; Mutmainah *et al*., 2024).

Figure 2. Learning Media Installation Process
Source: Authors' Documentation, 2025

Next, the smartphone application installation process is completed, providing guidance on application use and initial support when the media is used in the learning process (Alimuda *et al*., 2023). As for the guide to using Android-based learning media (in **Figure 2**):

1. Download the APK file from the provided source.
2. Open the APK file to start the installation.
3. Follow the on-screen instructions until the installation process is complete.
4. Open the application and follow the instructions, then start learning until it is finished.

The developed Android learning media has been validated by two experts: a content expert and a media and design expert. The validation assessment shows that the media meets the "very feasible" criteria.

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Table 2. Results of Material and Design Validation for Android Learning Media

Validation Type	Score (%)	Category
Material Expert	90	Very Suitable
Design Expert	88,75	Very Suitable

Source: Research Data, 2025

The results in **Table 2** show that the Android-based learning media developed received a very suitable rating from both validators, namely content experts and media/design experts. Validation by content experts yielded a score of 90%, while validation by media/design experts reached 88.75%. Both values fall within the "very suitable" category, indicating that the content, appearance, navigation, and interface design of the media meet the required learning standards. This shows that the media is not only accurate in its content but also engaging and easy for students to use in the learning process.

Implementation Stage

During the implementation stage, the Android application was tested in the classroom, followed by the distribution of questionnaires to teachers and students (Wati *et al*., 2022). The trial was conducted with 20 seventh-grade students of SMPN 5 Labakkang. The implementation took the form of a pilot test to evaluate the quality of the Android application from the perspectives of both teachers and students as end users.

First, a small-group trial was conducted involving nine seventh-grade students of SMPN 5 Labakkang, who were then divided into three groups. The first group consisted of three students categorized as lower learners, the second group comprised three students categorized as medium learners, and the third group included three students categorized as high learners. All three groups were asked to evaluate the Android application developed. This study employed purposive sampling, in which participants were selected based on specific criteria aligned with the study's objectives.

Tabel 3. Hasil Uji Coba Kelompok Kecil Penggunaan Media Pembelajaran Android

No.	Assessed Aspects	Score								
		S1	S2	S3	S4	S5	S6	S7	S8	S9
	Application Display									
1.	The application has an attractive interface	5	5	5	5	5	5	5	5	5
2.	The images on the application are easy to understand	5	4	4	5	5	5	5	5	5
3.	The images on the app are eye-catching	4	5	5	4	4	5	5	4	5
4.	The language used in the application is easy to understand	5	4	5	5	5	4	4	5	5
5.	The text or writing is clearly legible	4	5	5	4	5	5	5	5	5
6.	The images presented are clear and not blurry	5	5	4	5	4	5	5	5	5
7.	The application usage instructions are clear	4	5	5	5	5	5	5	5	5
8.	The delivery of material in the application is clear	5	4	5	4	5	5	5	5	5
9.	The color combination used is appropriate	4	5	5	5	5	5	5	5	5

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No.	Assessed Aspects	Score								
		S1	S2	S3	S4	S5	S6	S7	S8	S9
	Application Display									
	Application Interest and Usage									
10.	I can use the application anywhere (at school or outside school)	5	5	5	5	5	5	5	5	5
11.	My understanding of self-introduction in English has improved	5	4	4	5	5	5	5	5	5
12.	The concepts presented in the application are easy for me to understand	4	5	4	5	5	5	5	5	5
13.	Learning using applications makes me enthusiastic about learning	5	4	5	5	5	5	5	5	5
14.	There are no problems when I use the application	5	5	5	4	5	5	5	5	5
15.	The exercises in the application make it easier for me to learn	5	4	5	5	5	5	5	5	5
16.	The questions displayed are easy to understand	5	5	4	5	5	5	5	5	5
	Total	**75**	**74**	**75**	**76**	**78**	**79**	**79**	**79**	**80**
	Percentage	**94**	**93**	**94**	**95**	**98**	**99**	**99**	**99**	**100**
	Average	**97%**								

Source: Research Data, 2025

Based on the evaluation results, the small-group trial presented in Table 3 achieved an average score of 97%. This finding indicates that the level of practicality falls within the very practical category, indicating that the Android application effectively supports the learning process.

Second, an evaluation was conducted by the seventh-grade English teacher at SMPN 5 Labakkang to obtain feedback on the learning media and the implementation of the application program during the use of the Android application in classroom instruction, to determine the practicality level of the developed product.

Table 4. Results of Teachers' Responses to the Android-Based Learning Media

No.	Aspects	Score
1.	The application cover has an attractive appearance	5
2.	Layout adjustments in the application and a neat appearance	5
3.	The font used is appropriate	5
4.	The font size used is appropriate	5
5.	There are no problems in using the application	5
6.	The application usage instructions are clear	4
7.	The writing on the material, questions, and instructions is legible	5
8.	The application instructions are well readable	5
9.	The material in the application is in accordance with the teaching module	4

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No.	Aspects	Score
10.	The images and visuals presented attract students' interest and learning	4
11.	The application can be accessed by students anywhere	5
12.	The applications train students to enrich their knowledge	5
13.	The applications enhance students' learning experience	5
14.	The application makes it easier for students to understand learning materials	4
15.	The application attracts the attention of students	5
16.	The application makes the learning process in the classroom more effective and efficient	4
17.	The application provides clarity to the learning material	5
	Percentage	**94%**

Source: Research Data, 2025

The results of the teacher response questionnaire, presented in Table 4, indicate an average of 94%. This finding indicates that the level of practicality falls within the very practical category, indicating that the developed Android application effectively supports the learning process.

Evaluation Stage

The test was conducted to assess student learning outcomes by evaluating the effectiveness of the product, as reflected in pre-test learning outcome evaluation questions administered at SMPN 5 Labakkang to 20 students before studying the material in the application. This aimed to assess students' prior knowledge of the material (Malik *et al*., 2024). After studying the Android application material, students complete post-test questions to assess their knowledge.

Table 5.Comparison Results of Pretest and Posttest on Android Learning Media

Test Type	Average Score	Improvement
Pretest	61,3	-
Posttest	88,3	+27

Source: Research Data, 2025

The results presented in Table 5 indicate a significant improvement in students' learning outcomes following the implementation of Android-based learning media. The average pretest score of 61.3 increased to 88.3 on the posttest, representing a 27-point gain. This finding suggests that the developed media are effective in enhancing students' understanding of the learning material, particularly in English-language instruction. The improvement in scores also reflects the media's effectiveness in facilitating independent learning, providing practice exercises, and enhancing listening skills through its audiovisual features. Overall, Android-based learning media have been shown to support a more interactive, flexible, and meaningful learning process (Arifah et *al*., 2025).

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Discussion

The needs analysis indicates that the development of Android-based learning media is highly urgent at SMPN 5 Labakkang. Because the learning process remains teacher-centered and instructional media are limited to printed textbooks, students have difficulty understanding English-language content. The absence of a language laboratory further constrains the development of students' listening skills. These findings are consistent with previous studies indicating that the lack of interactive media in English instruction negatively affects students' motivation and comprehension (Prasetyo *et al*., 2017). This study confirms that interactive digital media can serve as a strategic solution to support the *Kurikulum Merdeka*, particularly in promoting contextual and enjoyable learning experiences. The Analysis, Design, Development, Implementation, and Evaluation (ADDIE) stages were systematically applied in the product development process (Ardini & Safran, 2024). Interactive learning media have strong potential to enhance students' interest in learning through more dynamic and engaging approaches (Rosyiddin *et al*., 2023). PowerPoint, iSpring Suite, and Website 2 APK Builder were integrated into the design of this Android-based media to produce both offline and online applications. The instructional content focused on *Chapter 1: Galang from Kalimantan*, aligned with the English Learning Objectives (*ATP Bahasa Inggris*) for Grade VII, Phase D. The novelty of this study lies in the use of software tools that are easy for teachers to operate without programming expertise, thereby supporting replicability and sustainability of media development by educators in other schools.

Validity testing results indicate that the developed media falls into the "very valid" category, with scores of 84% and 88.75%, respectively. Content validity encompasses alignment with learning outcomes, logical organization of material, and a user-friendly, intuitive interface. These results are consistent with prior research emphasizing that effective learning applications must ensure content clarity, logical structure, and the integration of interactive features (Mardiana *et al*., 2021). Thus, the product meets both pedagogical and technical standards for classroom implementation. The practicality aspect was evidenced by positive responses from both students and teachers during small- and large-group trials. The media was perceived as easy to use, engaging, and supportive of independent learning. Teachers also reported that the application reduced instructional workload, as students could learn autonomously using their smartphones. Several technical limitations, such as manual application installation and limited interactivity within the student worksheets (LKPD), were identified and addressed during the revision process. Unlike previous studies that relied on complex Android Studio development, this research highlights the use of simple tools capable of producing high-quality media that can be readily replicated by teachers (Latifa et. al., 2020).

Learning outcomes improved from an average pretest score of 71% to 93% on the posttest, indicating that the media effectively enhanced students' English proficiency, particularly in comprehension and self-introduction skills. Questionnaire results revealed that 93% of students agreed that the application helped them understand the topic, while 87% reported that it made learning more enjoyable. This effectiveness aligns with prior findings demonstrating substantial improvements in students' learning outcomes (Mardiana *et al*., 2021). Other studies similarly conclude that Android-based interactive learning media positively influence students' achievement, confirming that such media are valid, practical, and effective (Kartini & Putra, 2020). The innovation of this study lies in integrating accessible technology that can be utilized by teachers without information technology backgrounds while fully adapting the content to the *Kurikulum Merdeka*. In contrast to previous research that primarily emphasized visual and technical design, this study also considers practical implementation in schools with limited infrastructure. Therefore, the developed media is not only pedagogically innovative but also highly applicable within secondary education contexts in regions with constrained educational resources.

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CONCLUSION

This study successfully developed an Android-based learning media for English instruction for Grade VII students at SMPN 5 Labakkang using the ADDIE model. The developed media was designed based on the needs of both teachers and students for interactive and contextual learning resources. Validation results from subject-matter experts and media experts indicate that the learning media is highly feasible for instructional use. The practicality test, based on responses from teachers and students, demonstrates that the media is easy to use and visually engaging. Furthermore, the effectiveness test conducted through pretest and posttest results reveals a significant improvement in students' learning outcomes. These findings confirm that the developed Android-based learning media is valid, practical, and effective in enhancing students' English language comprehension and can be implemented as an alternative technology-based learning solution at the junior high school level. To optimize its implementation, it is recommended that teachers integrate the media into regular classroom instruction and continue developing follow-up learning materials. Students are encouraged to utilize the application for independent learning, while schools are expected to provide institutional support in terms of facilities and teacher training. Future research may focus on developing similar learning media for different English topics or educational levels by incorporating more advanced and interactive features.

AUTHOR'S NOTE

The author declares that there is no conflict of interest in the publication of this article. The author confirms that all data and content presented in this article are free from plagiarism.

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