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# Interactive Learning Media for Mastering Lampung Language Vocabulary in 4th-5th Grade Elementary School Using the ADDIE Model

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**Abstract**: The teaching of the Lampung language at the elementary school level continues to encounter significant obstacles, particularly the limited ability of students to master vocabulary due to teaching methods that lack dynamism and interactivity. This research aims to develop an interactive learning media application to enhance the daily vocabulary proficiency in the Lampung language among fourth and fifth-grade students at SD Negeri 1 Surabaya Udik. The application was developed using the ADDIE model, which encompasses five key stages—analysis, design, development, implementation, and evaluation—as a framework for instructional system design. It incorporates interactive features such as learning materials, educational videos, quizzes, and digital exercises, accessible across various devices. Findings reveal that the use of this interactive learning application significantly boosts students' engagement and enthusiasm for learning the Lampung language, while also facilitating a more effective grasp of vocabulary. The application's impact was assessed through a pre-test and post-test method applied to fourth and fifth-grade students, demonstrating a marked improvement in vocabulary mastery compared to traditional teaching approaches. This study adopts a quasi-experimental approach with a pre-test and post-test design without a comparison group, testing students before and after using the application. The application is anticipated to serve as a novel solution in supporting the preservation of regional languages through a technology-driven learning strategy.

**Keywords**: Interactive Learning Media; Vocabulary; Lampung Language; Learning Application; ADDIE Model.

## 1. Introduction

Any means or instruments used to convey ideas or messages, ensuring they are communicated effectively and efficiently to the intended audience, are termed learning media. These tools become educational media when they serve instructional or facilitative purposes. Interactive learning media have gained prominence in modern education, especially for fostering two-way engagement between learners and the application. Interactivity implies active participation and mutual exchange between users and the medium. Meanwhile, multimedia refers to a blend of various formats, including text, graphics, sound, video, and animation, integrated into a unified presentation. Since the 1980s, multimedia has acted as a powerful vehicle for information, stimulating thought, emotion, attention, and curiosity in learners to fulfill educational objectives [1]. Far beyond simple display tools, multimedia amplifies student engagement in their learning journeys. The role and significance of interactive learning media in education has been widely examined in academic research. Such tools are essential for teaching fourth and fifth graders in elementary schools, particularly in helping them master vocabulary in regional languages like Lampung. A structured framework for developing effective learning media is the ADDIE model, which encompasses Analysis, Design, Development, Implementation, and Evaluation. This methodical approach guides developers through five critical stages of instructional design, ensuring the end product meets educational demands. Ulgari *et al.* (2023) argue that employing the ADDIE model to craft interactive multimedia establishes a well-organized pathway, resulting in high-quality learning resources suited to student needs [2]. This method also allows weaving in local cultural elements, crucial for teaching a regional language like Lampung. Embedding cultural nuances into educational tools heightens their relevance and impact, as noted by Budiono *et al.* (2023) when addressing Lampung language vitality preservation [3].

However, challenges in learning regional languages such as Lampung still exist in many elementary schools, including SD Negeri 1 Surabaya Udik. A survey among fourth and fifth grade students at the school painted a worrying picture: more than half of them struggled with basic Lampung words. Teacher interviews further revealed that current teaching methods are heavily biased towards routine, lacking the energy needed to spark active learning. Traditional approaches, which often center on memorization without practical application, worsen vocabulary retention. Kusuma *et al.* (2023) support the view that conventional teaching strategies fail to inspire students, necessitating technology-based innovations such as interactive learning media to bridge the gap [4]. Therefore, creating engaging educational materials is essential for regional language education. Technology-based interactive learning media offers a promising solution to this enduring problem. Shalikhah (2017) suggests that tools such as Lectora Inspire can revolutionize learning by making it immersive and engaging [5]. Specifically, Akhiruddin *et al.* (2024) showed that digital interactive storytelling serves as a new approach to language education, enhancing comprehension but also building an emotional connection with the material [6]. Such tactics are particularly relevant for Lampung language teaching, where elements such as pronunciation audio, engaging quizzes, and simulations can help students apply vocabulary practically. In addition, Aisy *et al.* (2024) showed that digital games rooted in local Lampung culture can significantly increase students' interest in learning regional languages [7]. By incorporating these features into educational instruments, interactive media becomes more than just a tool—it emerges as a guardian of cultural heritage.

To address the challenges at SD Negeri 1 Surabaya Udik, the present study focuses on developing an interactive learning application aimed at enhancing Lampung vocabulary mastery. The system integrates various media elements, including instructional videos, online quizzes, and digital tasks, designed using the ADDIE framework. Technology is leveraged to deliver a more engaging and efficient learning experience, countering traditional teaching limitations. The application's effectiveness is assessed through pre- and post-test evaluations to track improvements in students' vocabulary skills. Prihantini *et al.* (2021) emphasize that crafting interactive learning tools tailored to student needs can elevate educational quality, especially in elementary settings [8]. Thus, the application aims to increase Lampung language proficiency but also instill greater confidence and enthusiasm among students for learning a regional tongue.

The study evaluates the effectiveness of an interactive learning application in improving daily Lampung vocabulary skills among fourth and fifth graders at SD Negeri 1 Surabaya Udik. Additionally, it seeks to heighten student motivation and interest in learning Lampung through appealing, interactive tools. It also develops teaching materials relevant to everyday life. The objective includes encouraging active student participation through features like quizzes, simulations, and pronunciation audio. More specifically, the research addresses the widespread issue of poor vocabulary retention due to uninspired instruction and scarce learning resources. By enhancing Lampung language skills, students are expected to build self-assurance in daily interactions, indirectly aiding local culture and identity. The implications of the research extend beyond students to include teachers and educational institutions. Interactive learning solutions are anticipated to provide teachers with a more impactful teaching alternative, underscoring the value of technology in regional language education. The outcomes can set a benchmark for other schools seeking to integrate technology to improve regional language

instruction. Furthermore, by raising student awareness of Lampung as a vital cultural element, the research aims to bolster efforts to sustain regional languages amid globalization pressures. Drawing from related literature, it becomes clear that technology-driven interactive learning media hold substantial potential to overcome barriers in regional language education, especially in vocabulary acquisition for Lampung. As a practical measure, the research designs an interactive learning app using platforms like Google Sites and AppsGeyser, ensuring accessibility across various mobile devices. Adopting the ADDIE model, each development stage is carried out regularly to align with student needs and learning goals. Through such a method, Lampung vocabulary is expected to become more accessible in everyday scenarios, while strengthening ties to local traditions among students. Ultimately, the study aspires to play a significant role in both academic advancement and the promotion of Lampung language and culture as integral to national identity.

## 2. Related Work

The development of interactive learning media, particularly those leveraging technology to enhance vocabulary mastery in regional languages such as Lampung, has garnered significant attention in educational research. This section reviews prior studies that intersect with current research, encompassing a wide array of themes including interactive multimedia, the preservation of regional languages, theoretical foundations of learning and language acquisition, the ADDIE instructional design model, supportive technological platforms, and context-specific learning media development. By synthesizing these diverse perspectives, this study aims to address existing gaps and contribute to the advancement of technology-driven solutions for regional language education, specifically focusing on vocabulary acquisition among elementary school students in Lampung. Interactive multimedia has emerged as a powerful tool for boosting student engagement in learning environments. Research by Abbas*et al.* (2020) demonstrates that multimedia-based interactive learning significantly enhances student participation in educational activities [9]. Their findings underscore the potential for multimedia to transform traditional teaching methods by making lessons more dynamic and appealing. However, their study lacks a quantitative assessment of the impact of such tools on vocabulary mastery. This leaves a gap in understanding the measurable outcomes of multimedia interventions. Similarly, Mustofa and Firmansyah (2023) developed interactive multimedia for sports education in elementary schools, reporting heightened student interest and involvement [17]. Their work highlights multimedia versatility in various subject areas but does not specifically address language learning outcomes. Chung (2023) further complements these insights by exploring the efficacy of visual aids in vocabulary acquisition within English as a Foreign Language (EFL) classrooms, emphasizing that visual elements play a critical role in reinforcing language retention [24]. Despite these contributions, there remains a need for studies that empirically evaluate multimedia tools' effectiveness in regional language contexts. The present research seeks to bridge this gap by designing an interactive application for Lampung vocabulary learning, with its impact rigorously measured through pre- and post-test evaluations to provide concrete evidence of vocabulary improvement among students.

Preservation of regional languages is a pressing concern, particularly as globalization and the dominance of national languages threaten linguistic diversity and cultural identity. Hartono (2016) underscores the importance of safeguarding the Lampung language, highlighting its role in maintaining cultural heritage [10]. However, Hartono's study stops short of proposing technology-based solutions to counteract Lampung decline among younger generations, identifying a critical area for further exploration. Building on this, Susiati (2020) advocates for the integration of engaging, technology-driven methods to revitalize interest in regional languages among students [11]. She argues that innovative approaches are essential to combating the diminishing exposure to these languages in everyday settings. The current study aligns with this perspective by developing a technology-enhanced interactive learning application tailored to Lampung vocabulary acquisition. By embedding cultural elements and practical usage scenarios, the application aims to foster linguistic proficiency but also a deeper connection to Lampung cultural identity. This is done by addressing the limitations of prior research that lacked actionable technological interventions.

The theoretical frameworks underpinning multimedia learning and language acquisition provide a robust foundation for designing effective educational tools. The Cognitive Theory of Multimedia Learning by Mayer, which emphasizes the simultaneous processing of verbal and visual information to enhance knowledge retention, serves as the guiding principle in this study. This theory suggests that learners benefit most when information is presented in dual modes, reducing cognitive overload and improving comprehension. Additionally, the principles of language acquisition advocate contextual and interactive learning environments to ensure vocabulary is learned meaningfully. Gohar (2023) supports this approach through a microlearning program designed for university students in an English for Specific Purposes (ESP) context, demonstrating that bite-sized, focused learning modules can significantly reduce cognitive load while enhancing vocabulary

retention [21]. Similarly, Fitriani *et al.* (2024) employed cartoons as a mnemonic strategy to teach vocabulary in analytical exposition texts, achieving notable success in student engagement and retention [25]. Inspired by these findings, the current research integrates contextual learning scenarios and interactive elements into the Lampung vocabulary application. This ensures that students learn words in relatable, everyday contexts supported by visual and auditory stimuli. This approach aims to maximize retention and practical application, distinguishing it from traditional rote memorization methods that often fail to sustain long-term learning.

The ADDIE model, encompassing the phases of Analysis, Design, Development, Implementation, and Evaluation, stands as a cornerstone in the systematic development of instructional materials, particularly interactive learning media. Anggraini *et al.* (2021) highlight the effectiveness of the ADDIE model in creating structured and engaging learning content, specifically for introducing letters and numbers through interactive multimedia [12]. Their study illustrates how ADDIE ensures educational materials are both pedagogically sound and appealing to learners. Maryani and Arroyani (2024) further demonstrate the model's adaptability by applying it to developing content for occupational purposes, such as nursing vocabulary, showcasing its relevance across diverse educational contexts [19]. Evelina *et al.* (2024) also report success in using ADDIE to create a vocabulary webpage for EFL students, noting improvements in engagement and independent learning capabilities [20]. Moreover, Kazanidis and Pange (2022) provide a comparative analysis of ADDIE in distance education, affirming its reliability as a framework for designing effective learning solutions [23]. Additional studies by Silitonga *et al.* (2022), Tasmiyah *et al.* (2023), Rustandi (2021), and Adeoye *et al.* (2024) reinforce ADDIE's versatility in developing e-modules, web-based materials, and other educational resources, consistently yielding positive outcomes in terms of usability and learner satisfaction [27][28][31][32]. Drawing on this extensive body of evidence, the present research adopts the ADDIE model to guide the development of an interactive learning application for Lampung vocabulary. By adhering to its systematic phases, the study ensures that the application is meticulously tailored to meet the specific needs of elementary students. Each stage—from analyzing learner requirements to evaluating the final product—carefully executed to maximize educational impact.

Technological platforms are a key factor in making technology-enhanced interactive learning media available for production and broadcasting. Islanda and Darmawan (2023) specify that Google Sites to be flexible and user-friendly for creating interactive learning tools because Google Sites can integrate visual and audio easily [13]. Madhani and Susilo (2023) respond similarly to Google Sites, which leads to an increased attention after the materials are constructed or after class session, and indirectly makes engaging activity on their learning environment, in nowadays' learning approach, this is an amazing tool for a learning activity [29]. Reciprocally, Puspananda *et al.* (2023) emphasizes the usefulness of AppsGeyser that is an online software program making the creation of Android apps on android-based devices without a significant amount of programming facilities, which enhances the effectiveness to develop m-education tools [14]. In addition, Surahman (2022) highlights the importance of Android-based mobile learning applications in language education due to the learners' accessibility and convenience [18]. Merliana and Tantri (2019) adopt a wider view to technology-enhanced language learning where the use of technology is advocated for in different educational contexts [15]. Referring to these observations, we utilized Google Sites and AppsGeyser to create a simple, multiplatform interactive application for Lampung vocabulary learning. These synergistic platforms help ensure that the app can be used on different platforms and with different learners (and technology access levels), thereby multiplying its reach and usability.

There has been recent educational research on the context-based development of media for engaging learning and this work is relevant to the adaptation of content to a particular group of learners or subject area. Apiswanto *et al.* (2019), designed a motion graphic school profile, exemplifying the potential of visual storytelling in an educational [16]. Mahmudin and Saprudin (2023) created interactive media in informatics lessons with a Research and Development (R&D) approach, which shows the necessity of iterative design which meets specific curriculum aims [22]. Dayanti *et al.* (IE'23) developed interactive media on teaching human respiratory system to elementary students, which demonstrated the usability of such tools in teaching science [31]. Sakerani *et al.* (2023) created a wetland-centric pop-up book to supplement English vocabulary and numeracy dispositions in the kindergarten curriculum as an example of how localized content could enrich learning experiences [26]. Additionally, Rahim *et al.* (2023) investigated science teachers' views of online learning and discovered a favorable disposition that reflects a prevailing tendency towards embracing digital support in education [33]. Together, these studies contribute to the present research by supplying models for how interactive media can be developed that are responsive to particular cultural and educational contexts. In this respect, the Lampung vocabulary app integrates the components of local culture and practical purposes. This allows for an interest and sense of national pride and ownership over one's linguistic heritage in their language to prevail.

The findings of the literature review jointly emphasize the relevance of the technology-based interactive learning media to improve vocabulary attainment; this is also relevant to a local language such as Lampung. To keep feeders focused, interactive multimedia draws reader interest and keeps pages turning; and it is

mission-critical to keep regional languages alive, as that breast-pocket-size space can accommodate only so much translated material. Models like Mayer's Cognitive Theory of Multimedia Learning, and principles of situated language learning lay useful foundations to develop educational multimedia tools that work. The ADDIE model provides a methodological road map to development, by means of which instructional products are pedagogically sound and learner-centered. Enabling technologies such as Google Sites and AppsGeyser support cost-effective and ubiquitous development of cross-platform applications, and user-specific research studies recognize the significance of culturally-based learning in the instructional design process. Addressing these deficiencies in existing literature (particularly absence of quantitative impact assessment and technology based solutions to preserve a regional language), this paper aims to design an engaging and effective interactive learning application using the ADDIE model and the Google sites and AppsGeyser. Ultimately, the aim is to contribute to the Lampung language education of young children, to an extent that is significant in terms of both language and culture, which is under threat from the current modern society.

## 3. Research Method

### 3.1 Data Collection Methods

The research methodology employed in this study utilizes a combination of data collection techniques to gather comprehensive information regarding the development of an interactive learning application for Lampung language vocabulary mastery among elementary school students. The methods include literature review, observation, and interviews, as detailed below:

1) Literature Review
   This method involves an in-depth exploration of academic journals, articles, and other scholarly resources focusing on interactive learning applications, multimedia in education, and the teaching of the Lampung language at the elementary level. The literature review aims to establish a theoretical foundation for the study, identify gaps in existing research, and provide insights into effective strategies for technology-based language learning. Sources are selected based on relevance, credibility, and recency to ensure the information aligns with current educational trends and technological advancements.
2) Observation
   Direct observation will be conducted at SDN 1 Surabaya Udik to examine the existing process of teaching the Lampung language. The observation will focus on several key aspects, including student-teacher interactions, the level of student engagement and interest during lessons, the effectiveness of current teaching methods, students' comprehension of Lampung vocabulary, and their responses to the learning media used. This method will provide firsthand data on the practical challenges and opportunities within the classroom setting, which will inform the design of the interactive application. Observations will be carried out systematically over a specified period to capture consistent patterns and behaviors.
3) Interviews
   Semi-structured interviews will be conducted with Lampung language teachers and students at SDN 1 Surabaya Udik to gain deeper insights into the challenges faced during the learning process, expectations for an ideal learning medium, and prior experiences with educational tools or media. The interviews aim to uncover specific needs and preferences that will guide the development of the interactive learning application. Responses from these interviews will serve as a primary reference in designing a user-centered application that addresses real-world issues encountered by both educators and learners. The data collected will be analyzed qualitatively to identify recurring themes and actionable feedback.

### 3.2 System Development Method

The development of the interactive learning application for enhancing Lampung vocabulary mastery among fourth and fifth-grade elementary students employs the ADDIE model, which stands for Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is a widely recognized and effective instructional design framework that provides a systematic and iterative approach to creating educational tools, ensuring that the resulting application is both pedagogically sound and tailored to the target audience's needs. This model was chosen due to its structured phases, which facilitate continuous improvement and alignment with learning objectives.

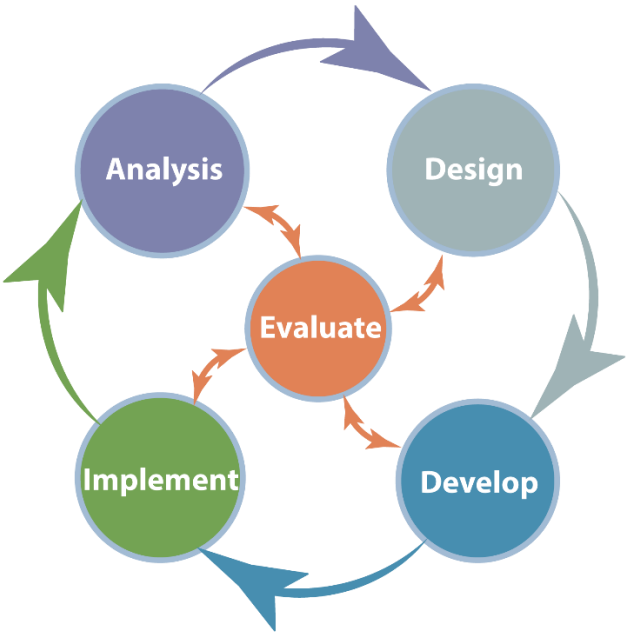


Figure 1. ADDIE Model Concept

Below is a detailed explanation of each phase of the ADDIE model as applied to the development of the interactive learning application for Lampung vocabulary:

1) Analysis
   The analysis phase serves as the foundation for the entire development process by identifying the specific needs and challenges related to Lampung language learning. This phase involves several key activities:
   a) Problem Identification
      Analyzing the primary obstacles in teaching and learning the Lampung language, such as low vocabulary mastery among students due to limited exposure or ineffective teaching methods.
   b) Needs Assessment
      Collecting data through surveys, interviews with fourth and fifth-grade students and their Lampung language teachers, and classroom observations over a four-week period to understand the specific requirements for an effective learning medium.
   c) Learning Objectives Definition
      Establishing clear goals for the application, such as improving students' mastery of everyday Lampung vocabulary and fostering cultural appreciation.
   d) Target Audience Analysis
      Examining the characteristics, learning styles, and technological familiarity of fourth and fifth-grade students to ensure the application is age-appropriate and engaging.
   e) Content Requirements
      Determining the topics and materials to be included in the application, focusing on relevant vocabulary themes and culturally significant content.
      This comprehensive analysis ensures that the subsequent phases are grounded in real user needs and educational goals.
2) Design
   The design phase focuses on creating a blueprint for the interactive learning application based on the findings from the analysis phase. Key activities include:
   a) General Application Design
      Defining the core elements of the application, such as visual aesthetics, audio components, and interactive features, to align with the learning objectives and engage young learners.
   b) Flowchart Development
      Creating a detailed flowchart or user journey map to outline the logical sequence of content delivery and ensure a user-friendly navigation experience.
   c) Learning Method Selection
      Designing instructional strategies to be embedded in the application, such as interactive quizzes, folklore narratives, and animated videos, to enhance vocabulary comprehension and retention.
   d) Assessment Planning
      Determining the types of evaluation tools, such as quizzes or games, to measure students' vocabulary mastery and provide immediate feedback on their progress. This phase aims to create a cohesive

and engaging design that balances educational value with user enjoyment, setting the stage for effective development.

3) Development
During the development phase, the application is built using selected technologies, namely Google Sites and AppsGeyser, due to their flexibility, ease of use, and accessibility across multiple devices. These platforms were chosen over offline alternatives to facilitate easy distribution and updates. Key activities include:
   a) Content Creation
   Developing educational materials, including animated videos, interactive exercises, and culturally relevant content, to support Lampung vocabulary learning.
   b) Prototype Building
   Constructing an initial prototype of the application for preliminary testing and refinement.
   c) Functionality Testing
   Conducting black-box testing to ensure the application operates as intended, verifying that all features function correctly and the content is accurately presented without delving into the internal code structure.
4) Implementation
The implementation phase involves deploying the application in a real-world classroom setting at SDN 1 Surabaya Udik over a six-week period. Key activities include:
   a) User Training
   Providing training sessions for teachers to familiarize them with the application's features and guide them on integrating it effectively into their lessons.
   b) Application Deployment
   Introducing the application to students during regular Lampung language classes, with teachers facilitating its use as a primary learning tool.
   c) Data Collection
   Gathering data on application usage, student engagement, and feedback from both students and teachers to assess its practical effectiveness and identify areas for improvement. This phase tests the application's performance in an authentic educational environment, providing critical insights into its usability and impact on learning outcomes.
5) Evaluation
The evaluation phase assesses the overall effectiveness of the application in achieving its intended learning objectives through both formative and summative approaches. Key activities include:
   a) Formative Evaluation
   Conducting ongoing assessments at the end of each development phase (e.g., after design and development) to ensure the application aligns with educational goals and user needs, allowing for iterative improvements.
   b) Summative Evaluation
   Administering pre-tests and post-tests to measure students' vocabulary mastery before and after using the application, providing quantitative data on learning gains. Additionally, satisfaction surveys will be distributed to students and teachers to evaluate aspects such as interactivity, ease of use, and overall user experience.
   c) Revision and Enhancement
   Using feedback and evaluation results to make necessary revisions and updates to the application, ensuring it remains effective and relevant for future use. This final phase ensures that the application not only meets its initial objectives but also adapts to user feedback for continuous improvement.

## 4. Result and Discussion

### 4.1 Results

This research has resulted in the development of an interactive learning application aimed at enhancing the mastery of Lampung language vocabulary among students at SD Negeri 1 Surabaya Udik. The application was developed using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model, which consists of five systematic phases to ensure the creation of an effective and user-centered educational tool. The following subsections detail the outcomes and processes of each phase, along with the evaluation results and testing outcomes.

### 4.1.1 Analysis

During the analysis phase, the primary challenges in teaching and learning the Lampung language at SD Negeri 1 Surabaya Udik were identified through observations and interviews with teachers and students. The findings revealed that conventional teaching methods lacked interactivity and engagement, resulting in students struggling to master Lampung vocabulary. Many students showed low interest in the subject due to the absence of dynamic learning materials. Consequently, there was a clear need for an interactive learning application that could enhance student engagement and provide a more effective learning experience tailored to their needs.

### 4.1.2 Design

In the design phase, the concept and structure of the application content were developed to align with the identified needs of the students. The application was designed with a simple and intuitive navigation system to ensure accessibility for young learners. Key design elements included:

1) Flowchart Creation
   A detailed flowchart was developed to map out the application's navigation and content delivery sequence, ensuring a logical and user-friendly experience.
2) Multimedia Selection
   Visuals, audio, and animations were incorporated to aid in vocabulary comprehension.
3) Content Scope
   The learning materials focused on everyday Lampung vocabulary, supplemented by interactive quizzes, instructional videos, and a developer profile section at the end of the application for transparency and credibility.

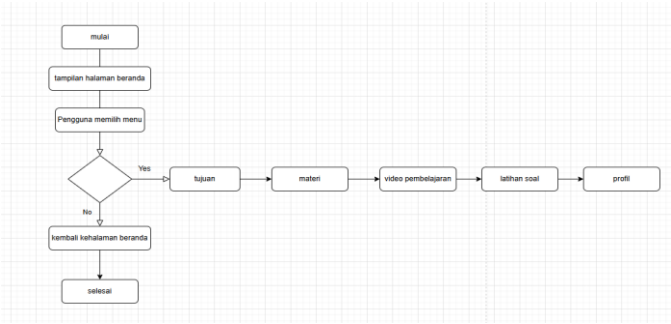


Figure 2. Design Flowchart of Application Navigation

### 4.1.3 Development

The development phase involved the actual creation of the application based on the design blueprint. The application was built using Google Sites and AppsGeyser due to their flexibility, ease of use, and compatibility with various devices. Key development activities included the creation of learning materials in multiple formats such as text, audio, and interactive videos to cater to diverse learning styles, the integration of core features like interactive quizzes and simulations to enable students to test their understanding of Lampung vocabulary, and initial testing through black-box testing to ensure the application functioned as intended without technical issues before full implementation.


Figure 3. Homepage Interface


Figure 4. Objectives Page Interface


Figure 5. Materials Page Interface

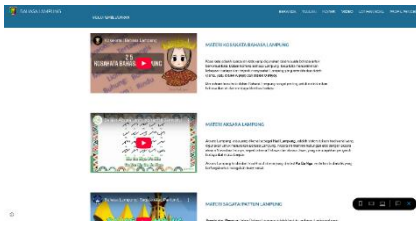

Figure 6. Learning Videos Page Interface


Figure 7. Quizzes Page Interface


Figure 8. Developer Profile Page Interface

The application's interface was structured into several key pages, including the Homepage, which displays a welcome message and navigation icons to sections such as Objectives, Materials, Learning Videos, Quizzes, and Developer Profile (see Figure 3: Homepage Interface); the Objectives Page, which explains the learning objectives for Lampung vocabulary mastery and includes a "Home" button to return to the main menu (see Figure 4: Objectives Page Interface); the Materials Page, which contains modules with Lampung language content specifically designed for fourth and fifth-grade students, along with a "Home" button (see Figure 5: Materials Page Interface); the Learning Videos Page, which features a collection of instructional videos, regional songs, and Lampung poetry, with a "Home" button for navigation (see Figure 6: Learning Videos Page Interface); the Quizzes Page, which provides access to interactive quizzes via Google Forms to allow students to practice vocabulary, including a "Home" button (see Figure 7: Quizzes Page Interface); and the Developer Profile Page, which displays the researcher/developer's biodata and photo for transparency, also equipped with a "Home" button (see Figure 8: Developer Profile Page Interface).

### 4.1.4 Implementation

Following development, the application was implemented at SD Negeri 1 Surabaya Udik. The implementation process involved training and socialization, where teachers and students received guidance on how to use the application effectively, a trial period during which the application was tested in the classroom over several weeks as part of regular Lampung language lessons, and data collection through observations and questionnaires to evaluate the application's effectiveness in enhancing vocabulary mastery. During this phase, teachers reported increased student participation, while students demonstrated enthusiasm for using the interactive features of the application.

### 4.1.5 Evaluation

The evaluation phase focused on assessing the success of the application in achieving its learning objectives. Both formative and summative evaluations were conducted, producing the following key findings: significant improvement in students' mastery of Lampung vocabulary as evidenced by pre-test and post-test results, increased motivation and active participation in lessons as reported by teachers after students used the application, and overwhelmingly positive feedback from satisfaction surveys completed by students and teachers, who highlighted the application's interactivity and ease of use. The detailed evaluation results are summarized in the table below:

Table 1. Evaluation Results for Application Impact on Learning Outcomes

| No | Evaluation Aspect | Before Using Application | After Using Application |
|---|---|---|---|
| 1 | Average Vocabulary Mastery Score (Pre-test vs. Post-test) | Low | Significantly Improved |
| 2 | Student Learning Motivation | Low Enthusiasm | Highly Motivated |
| 3 | Student Participation Level in Learning | Passive | More Active |
| 4 | Comprehension of Vocabulary Material | Limited | Improved |
| 5 | Student Response to Application (Survey-Based) | Not Applicable | Positive |
| 6 | Teacher Response to Application Effectiveness | Not Applicable | Effective in Teaching |

Based on the table above, the interactive learning application proved effective in enhancing Lampung vocabulary mastery, increasing student motivation, participation, and comprehension. The positive feedback from both students and teachers underscores the application's superiority over conventional teaching methods.

### 4.1.6 Black-Box Testing Results

Black-box testing was conducted to verify that the application met the specified functional requirements without examining the internal code structure. The testing focused on user interaction and overall performance. The results are presented in the table below:

Table 2. Summary of Application Testing Results and Corrective Actions

| No | Test Type | Test Result | Issues Identified | Corrective Actions Taken |
|---|---|---|---|---|
| 1 | Navigation Testing | All buttons and menus functioned correctly. | None | None |
| 2 | Content Display Testing | Text, images, audio, and videos displayed properly. | Buffering issues on slow connections | Optimized video file sizes |

| | | | | |
|---|---|---|---|---|
| 3 | Quiz Functionality Testing | Quizzes were accessible, functional, and results were accurately recorded. | Incompatibility on small screens | Adjusted design for responsiveness |
| 4 | Compatibility Testing | Application worked across devices (smartphones, tablets, computers). | Quiz answers not saved in some cases | Fixed answer storage system |
| 5 | Responsiveness Testing | Quick loading times and smooth page transitions. | Minor bugs on older Android versions | Optimized compatibility for older versions |

The testing outcomes confirm that the application meets the expected functionality standards. However, minor issues such as buffering on slow connections and compatibility on older devices were identified and addressed through targeted optimizations. Further improvements are planned to enhance the user experience, particularly for students with limited access to advanced technology.

### 4.2 Discussion

Drawing from the research outcomes, the development of an interactive learning application has successfully boosted the mastery of Lampung language vocabulary among students at SD Negeri 1 Surabaya Udik through the structured application of the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The ADDIE framework was selected for its systematic, user-focused approach, a choice backed by Kazanidis & Pange (2022), who affirm its effectiveness in crafting educational tools tailored to learners' needs [23]. During the analysis phase, it became apparent that traditional teaching methods lacked engagement and interactivity, resulting in diminished student interest and understanding of the Lampung language. Such findings align with Budiono *et al.* (2023), who points out the struggles in preserving regional languages like Lampung due to outdated pedagogical approaches [3].

To address these challenges, the design phase prioritized a straightforward, user-friendly navigation system suitable for young learners. Multimedia elements, including images, audio, and animations, were integrated to aid vocabulary acquisition, a strategy supported by Chung (2023), who demonstrated the value of visual aids in enhancing language learning [24]. Moving to the development stage, the application incorporated key features such as interactive quizzes and simulations, enabling students to test their grasp of concepts directly. Building the tool on platforms like Google Sites and AppsGeyser proved practical, as highlighted by Islanda & Darmawan (2023) and Puspananda *et al.* (2023), who praise the adaptability and ease of use these platforms offer for educational media creation [13][14]. At the implementation stage, the application was rolled out at SD Negeri 1 Surabaya Udik with training and orientation sessions for both teachers and students, followed by a multi-week trial during Lampung language classes. The results showed a marked rise in student participation and enthusiasm for the interactive components, as noted by teachers. Such observations are reinforced by Ulgari *et al.* (2023), who argue that interactive multimedia developed via the ADDIE model significantly boosts learner engagement [2]. The evaluation phase revealed a substantial improvement in Lampung vocabulary mastery, evidenced by pre-test and post-test comparisons, alongside favorable feedback from students and teachers on the tool's interactivity and usability. Akhiruddin *et al.* (2024) further validate these results, emphasizing the role of digital interactive media as a cutting-edge approach to language education [6].

The application offers several advantages, most notably enhancing learning flexibility by allowing students to access materials anytime across various devices. Interactive features like quizzes, instructional videos, and practice exercises make lessons far more engaging than conventional methods, a point echoed by Shalikhah (2017), who underscores the need for innovative educational media [5]. Diverse multimedia components also facilitate a more effective understanding of vocabulary, while immediate feedback mechanisms support better learning outcomes. Additionally, the tool aids in safeguarding regional linguistic heritage by delivering accessible, relevant Lampung language content, aligning with Susiati (2020), who stresses the urgency of preserving local languages through education [11]. On the downside, reliance on internet access poses a significant barrier for students with inadequate devices or connectivity. The lack of direct teacher interaction may also hinder comprehension of more intricate topics. Furthermore, optimal use demands thorough teacher training, a necessity backed by Prihantini *et al.* (2021) in their work on interactive learning media development [8]. Addressing these shortcomings calls for offline functionality to improve accessibility, alongside enhanced teacher training programs and broader deployment to other schools to amplify the impact on regional language education. The findings clearly indicate that technology-driven tools hold immense potential to advance vocabulary learning. Yet, to maximize their reach, further refinements are essential, including offline capabilities and more inclusive rollout strategies to ensure access for students from varied technological backgrounds.

## 5. Conclusion and Recommendations

The research has successfully crafted an interactive learning media application as a fresh approach to enhancing Lampung language vocabulary mastery among fourth and fifth-grade students at SD Negeri 1 Surabaya Udik. Built using the ADDIE model, which encompasses Analysis, Design, Development, Implementation, and Evaluation phases, the application delivers a well-organized learning tool aligned with students' specific needs. Features such as instructional videos, practice exercises, and simulations create a more captivating learning experience compared to traditional teaching methods. Findings reveal that the application significantly boosts students' interest and drives to learn the Lampung language. It also enables them to grasp vocabulary more easily and efficiently. Teachers, in turn, benefit from a more dynamic way to present lessons, making classroom interactions far more engaging. Assessments through pre-tests and post-tests confirm a notable improvement in students' understanding of Lampung vocabulary after using the tool.

Despite the positive outcomes, certain challenges remain. A primary obstacle is the dependence on internet access, which can hinder usage for students in areas with poor connectivity. Developing an offline mode is strongly advised to broaden the tool's reach. Additionally, the teacher's role in the learning process remains vital, making specialized training for educators a priority to ensure seamless integration of the application into teaching practices. For future progress, expanding the study to other schools is recommended to evaluate the application's effectiveness across diverse learning environments. Aligning the tool with school curriculum could also ensure its sustained use. With further enhancements and refinements, the application holds the potential to serve as a powerful solution for advancing Lampung vocabulary skills while supporting efforts to preserve regional languages through technology-driven education.

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