

Implementasi edugame mobile untuk pembelajaran angghah ungguhin basa Bali di SD negeri 5 Mengwitani, Badung Bali

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Abstract:

The decline in students' interest and understanding of Angghah Ungguhina Basa Bali presents a significant challenge in Balinese language learning at the elementary level. This study aims to design and implement an interactive mobile-based edugame to enhance the comprehension of fifth-grade students at SD Negeri 5 Mengwitani. The research employed a research and development (R&D) method using both qualitative and quantitative approaches. Data were collected through observation, interviews, documentation, and pre-test and post-test assessments. The results indicate a substantial improvement in students' average scores, increasing from 40.9 in the pre-test to 91.3 in the post-test. Expert evaluations from media, content, and user perspectives also rated the edugame in the "highly feasible" category, with percentages above 90%. These findings demonstrate that mobile-based edugames are not only effective in improving learning outcomes but also play a vital role in preserving the Balinese language. The applied visual communication design successfully created a contextual, engaging, and student-friendly learning experience, making the edugame an innovative solution for teaching local content in elementary schools.

Introduction

This Balinese is one of more than 700 regional languages in Indonesia and is included among the 13 major local languages with more than one million speakers. As a valuable cultural heritage, the Balinese language functions not only as a means of communication but also as a symbol of identity, values, and the philosophy of Balinese life. However, in recent decades its existence has faced serious challenges. The dominance of the Indonesian language in formal education, the effects of globalization, and the penetration of media and popular culture have contributed to a language shift, particularly among the younger generation (Suandi & Mudana, 2020). This phenomenon is evident in the declining number of active Balinese speakers, especially in urban and tourism areas (Mustika, 2018). UNESCO has even categorized Balinese as a "vulnerable language" if systematic and sustainable preservation efforts are not carried out.

Theoretically, language as part of culture represents a symbolic system transmitted socially, and its maintenance depends heavily on intergenerational transmission (Inun, 2022). In the context of education, the introduction and learning of local languages such as Balinese must be conducted through pedagogical approaches that align with the characteristics of the younger generation. According to the constructivist learning theories of Piaget and Vygotsky, effective learning occurs when learners are actively engaged in exploration, interaction, and contextual meaning-making. Technology-based education, such as edugames, provides one promising approach that supports this principle

(Aditama, 2020). In addition, the theories of digital game-based learning are also relevant in explaining how game elements can enhance motivation and learning retention (Maulidina et al., 2018). From a visual communication design perspective, edugames can also be analyzed using Roland Barthes' (1977) theory of visual semiotics, which emphasizes the meaning behind visual symbols, and Stuart Hall's (1997) theory of cultural representation, which frames design as a construction of cultural identity. Thus, edugames function not only as learning media but also as a means of representing local cultural values.

Based on observations at SD Negeri 5 Mengwitani, Mengwi District, Badung Regency, it was found that fifth-grade students demonstrated low enthusiasm for Balinese language lessons. This was confirmed by interviews with the class teacher, Ni Luh Putu Deni Purnamayanti, S.Pd., who stated that most students experienced difficulties in understanding the material, particularly the topic of Anggah-Ungguhing Basa Bali. This material emphasizes linguistic etiquette according to social levels and interpersonal relations, requiring mastery of complex language structures and cultural norms. Unfortunately, the learning process still relied on conventional methods without engaging or relevant media, which negatively affected students' motivation and learning outcomes. Observation data revealed that the students' average score was only 66, while the Minimum Mastery Criteria (KKTP) was set at 73.

To address these challenges, innovative solutions are required for Balinese language learning, especially for complex topics such as Anggah-Ungguhing Basa Bali. One potential strategy is the development of a mobile-based edugame. This medium combines educational and entertainment elements, adopting the principles of technology-enhanced learning. Previous studies have shown that edugames can improve learning motivation, information retention, and student interaction (Khusna & Septikasari, 2025). Moreover, mobile devices are already part of children's daily lives, making them highly relevant and easily accessible media for learning (Nani Rosanti, Mu'amar, 2022).

The proposed solution in this study is the design and development of a mobile-based edugame specifically aimed at facilitating the learning of Anggah-Ungguhing Basa Bali for fifth-grade students at SD Negeri 5 Mengwitani. The application was designed using a user-centered design approach, involving the roles of teachers, students, and parents. Teachers could use the desktop version as teaching media in the classroom, while students and parents could access the mobile version for home learning. This approach ensures that learning becomes more engaging, flexible, and sustainable, while also helping to reawaken young learners' interest in the Balinese language and culture.

Based on this background, the purpose of this study is to design and develop an interactive mobile-based edugame to enhance students' interest and understanding of Anggah-Ungguhing Basa Bali. It also seeks to address the need for contextual, interactive, and student-centered learning media while contributing to the preservation of Balinese language and culture through elementary education.

Methods

This study employed both qualitative and quantitative descriptive approaches using the research and development (R&D) method. The objective was to design and implement a mobile-based edugame to support the learning of Anggah Ungguhing Basa Bali at SD No. 5 Mengwitani. This approach was selected to address the low level of student interest and comprehension of Balinese language learning, particularly in the Anggah Ungguhing Basa Bali topic. The research process involved the design, testing, and evaluation of the developed media (Sahronih et al., 2022).

The data sources in this study were divided into two types: primary and secondary data. Primary data were obtained directly through interviews, observations, and pre-test and post-test assessments (Dwiningrum et al., 2024). Secondary data included supporting documents such as the fifth-grade

Balinese language syllabus, student achievement records for the 2023/2024 academic year, and the textbook Kamus Angghah Ungguh Kruna, which served as the main reference for learning materials.

Data collection was conducted through four main techniques. First, interviews were carried out with Ni Luh Putu Deni Purnamayanti, S.Pd., the fifth-grade homeroom teacher, to gather information on the teaching methods used, learning media applied, student difficulties in understanding the material, and the potential integration of technology in the classroom. The interviews revealed that the teaching process was still conventional, dominated by textbooks and worksheets, and lacked interactive technology, resulting in passive learning and difficulties in mastering the subject.

Second, direct classroom observation was conducted to examine the learning situation, student engagement, and teacher instruction. The observations showed that learning was mostly one-directional, with students receiving information passively, leading to low enthusiasm. The learning media used consisted only of textbooks and worksheets, without visual or technological support.

Third, a pre-test was administered to 23 fifth-grade students to measure their initial comprehension of Angghah Ungguhing Basa Bali. The test consisted of 10 multiple-choice questions covering four levels of Balinese speech: alus singgih, alus madia, alus sor, and alus mider. The results showed an average score of 40.9, far below the Minimum Mastery Criteria (KKTP) set at 73.

Fourth, documentation studies were conducted using the syllabus and student performance records to strengthen the analysis of learning needs. The textbook Kamus Angghah Ungguh Kruna was also used as the primary reference for designing the content in the edugame.

The collected data were analyzed using two approaches. Qualitative analysis was employed to reduce and present interview, observation, and documentation data in narrative form to identify the need for interactive learning media. Quantitative analysis was applied to process the pre-test and post-test results using averages and percentages to measure the effectiveness of the developed media. After using the edugame, students' average post-test scores significantly increased to 91.3, indicating a substantial improvement in comprehension.

Additionally, feasibility evaluation was conducted through questionnaires distributed to three groups: media experts, content experts, and student users. Expert assessments used a Likert scale, while student evaluations employed a Guttman scale. The results showed that the media achieved very high feasibility ratings, ranging from 93% to 97%, in terms of design, content, and user experience. Based on these findings, the mobile-based edugame was declared suitable and effective for improving students' understanding of Angghah Ungguhing Basa Bali, while also providing more engaging and contextual learning.

Result and Discussion

This study produced an interactive mobile-based edugame designed for fifth-grade students at SD No. 5 Mengwitani. The media was developed to help students understand Angghah Ungguhing Basa Bali, one of the key topics in Balinese language learning that emphasizes linguistic etiquette according to social levels. Previously, this material had been taught conventionally using textbooks and worksheets, which proved less effective due to their monotonous nature and incompatibility with the characteristics of the digital generation.

To measure the effectiveness of the media, the researchers administered pre-tests and post-tests to 23 students. The pre-test results showed an average score of 40.9, which was far below the Minimum Mastery Criteria (KKTP) standard of 73. After using the edugame, the post-test average score increased significantly to 91.3. This demonstrates a substantial improvement in students' comprehension after utilizing interactive technology-based media. Although these results are significant, the study has several limitations. First, the sample size was limited to only 23 students from a single school, making it difficult to generalize the findings to a broader context. Second, the study

did not measure long-term retention whether students could still recall and understand the material after several months. Third, the gamification aspects of the application remain relatively simple; future research could add a reward system or adaptive difficulty to increase student engagement. With the addition of visual semiotic analysis and cultural representation, this study could also further demonstrate how design elements (such as color, typography, and illustration) construct cultural meaning beyond their purely educational function.

Table 1: Pre-Test

No.	Pertanyaan	Benar	Salah	Presentase Benar	Presentase Salah
1	Kruna “bernama” basa <i>alus singgih</i> nyané...	4	19	17,4%	82,6%
2	Ipun ngajeng bakso kanti waneh. Ring lengkara punika, kruna napi sané rumasuk kruna <i>alus singgih</i> ?	7	16	30,4%	69,6%
3	Kruna “tadi” basa <i>alus madia</i> nyané...	15	8	65,2%	34,8%
4	Titiyang nunas ampura. Ring lengkara punika, kruna napi sané rumasuk kruna <i>alus madia</i> ?	16	7	69,6%	30,4%
5	Kruna “lahir” basa <i>alus sor</i> nyané...	6	17	26,1%	73,9%
6	Ia mebaos sareng Ibu. Kruna “ia” basa <i>alus sor</i> nyané...	8	15	34,8%	65,2%
7	Kruna “belakang” basa <i>alus mider</i> nyané...	17	6	73,9%	26,1%
8	Cara puniki dangan, sakéwanten méwéh pisan kamargiang. Ring lengkara punika, kruna napi sané rumasuk kruna <i>alus mider</i> ?	6	17	26,1%	73,9%
9	I Bape ... lawar serapah ring peken Mengwi.	3	20	13%	87%
10	Ida malinggih ring ... krama banjaré.	12	11	52,2%	47,8%

Table 2: Pre-Test

No.	Pertanyaan	Benar	Salah	Presentase Benar	Presentase Salah
1	Kruna “bernama” basa <i>alus singgih</i> nyané...	23	0	100%	0%
2	Ipun ngajeng bakso kanti waneh. Ring lengkara punika, kruna napi sané rumasuk kruna <i>alus singgih</i> ?	22	1	95,7%	4,3%
3	Kruna “tadi” basa <i>alus madia</i> nyané...	23	0	100%	0%
4	Titiyang nunas ampura. Ring lengkara punika, kruna napi sané rumasuk kruna <i>alus madia</i> ?	21	2	91,3%	8,7%
5	Kruna “lahir” basa <i>alus sor</i> nyané...	22	1	95,7%	4,3%
6	Ia mebaos sareng Ibu. Kruna “ia” basa <i>alus sor</i> nyané...	23	0	100%	0%
7	Kruna “belakang” basa <i>alus mider</i> nyané...	21	2	91,3%	8,7%
8	Cara puniki dangan, sakéwanten méwéh pisan kamargiang. Ring lengkara punika, kruna napi sané rumasuk kruna <i>alus mider</i> ?	17	6	73,9%	26,1%
9	I Bape ... lawar serapah ring peken Mengwi.	19	4	82,6%	17,4%
10	Ida malinggih ring ... krama banjaré.	19	4	82,6%	17,4%

In addition to assessing student learning outcomes, the media was also evaluated by three categories of respondents: media experts, content experts, and students as users. The evaluation from two media experts resulted in a feasibility score of 93.7%, while the content expert awarded a score of 97.1%. The evaluation of students as users indicated a satisfaction rate of 96.4%. These three indicators collectively demonstrate that the media falls into the “highly feasible” category and can be optimally utilized in the learning process.

The development of the edugame media was carried out through three main stages: pre-production, production, and post-production. The pre-production stage began with a user needs study through classroom observation, interviews with the homeroom teacher, and an analysis of the syllabus and student learning outcomes. This stage also included the formulation of visual concepts, determination of illustration styles, selection of color schemes, and design of interface flows and application menus. The entire design was based on the characteristics of elementary school children, requiring visually appealing displays, simple navigation, and content that is both educational and enjoyable.

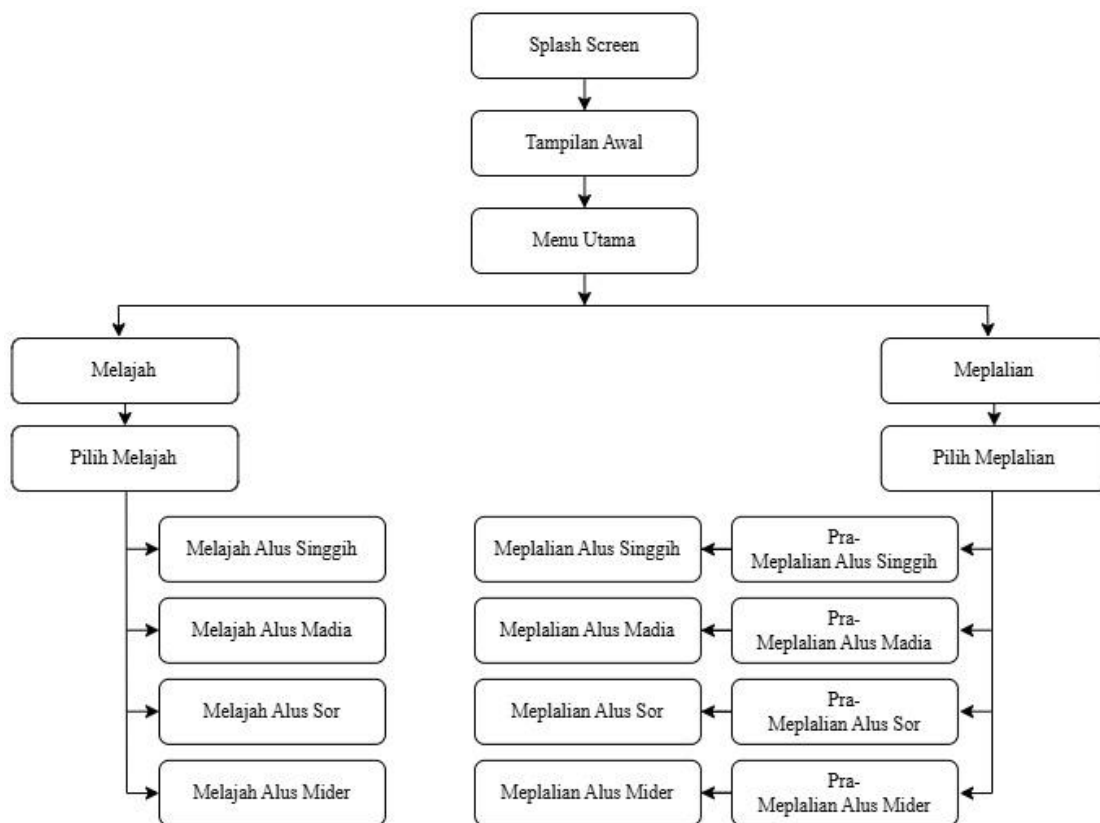


Figure 1. menu flowchart
Source: Dewi, 2024

In the production stage, all visual assets were created using design software such as Adobe Illustrator and Adobe Photoshop. The assets developed included the main character, figures representing the levels of Balinese speech (alus singgih, alus madia, alus sor, and alus mider), background illustrations, button icons, and interactive pop-up elements. The character design adopted a chibi style small figures with cheerful expressions and non-realistic body proportions, intended to more effectively capture children’s attention and foster emotional engagement.



Figure 2. Background design

Source: Dewi, 2024



Figure 3. Buttons Design

Source: Dewi, 2024

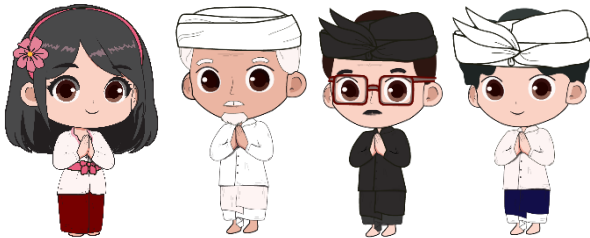


Figure 4. Character Design

Source: Dewi, 2024

The selection of the color palette was also a major consideration. The dominant colors used were light brown, cream, and pastel green. These colors were chosen based on child color psychology theory, which suggests that soft colors can create a sense of comfort, improve concentration, and reduce tension during learning. Colors were also strategically applied to differentiate language levels and menus within the application, thereby strengthening navigation functions and visual identification.

Typography in the application used the “Love You” font, a rounded sans-serif typeface that is easy for children to read while also conveying a friendly and informal impression. This choice was aligned with the fundamental principles of visual communication design, emphasizing readability, visual hierarchy, and audience appropriateness. The font size was adjusted for various mobile device screen resolutions and arranged in a clean, uncluttered layout free from distractions.

Love You.ttf

Love You

Figure 5. Font “Love You”

Source: Dewi, 2024

Animation aspects were also considered to enhance interactivity and sustain student interest. Frame-by-frame animation was applied to create character movements such as blinking and walking, along with transitions for pop-up questions and score displays. These animations were combined with sound effects to provide immediate feedback when students pressed buttons or answered questions, thereby enriching the multisensory learning experience (Siregar et al., 2024).

The post-production stage involved integrating all elements into the Construct 2 platform. Testing was conducted across multiple types of Android devices, and the media was also uploaded to the itch.io platform for online access. Two versions were developed: a desktop version for teachers to use in classroom learning, and a mobile version for students and parents at home. This ensured that the media functioned not only as a teaching aid but also as a flexible tool for independent learning.

From the perspective of Visual Communication Design, the media represented an interdisciplinary practice combining design, technology, education, and culture. Visual Communication Design played a significant role in shaping a visually engaging and meaningful learning experience. Each element from characters, icons, composition, colors, typography, to movement was deliberately crafted to support educational messages and create effective visual communication for elementary school children.

The media design also incorporated local Balinese cultural values, symbolically expressed through character clothing, ceremonial backgrounds, and local terms used in application navigation. In this way, the media not only served as a learning tool but also as a means of transmitting cultural values to the younger generation. This represents a tangible form of cultural-based visual learning that can be further developed in the context of preserving language and local traditions through design.



Figure 4. View Of Edugame
Source: Dewi, 2024

Pedagogically, the use of this media aligns with constructivist learning theory, which emphasizes the importance of active student participation in building knowledge through experience. The interactivity offered by the media positions students as active participants rather than passive recipients of information. From a Visual Communication Design perspective, this interaction is realized through an intuitive user interface and enjoyable user experience, highlighting the essential role of design in organizing information flow and shaping users' emotional engagement.

The integration of audiovisual and symbolic elements in this media also reflects the principles of visual semiotics in Visual Communication Design. Each visual element carries meaning: male characters represent language levels; background colors convey degrees of formality; animations and sounds

function as response codes to user actions. Together, these form a visual grammar that helps students understand and internalize the material indirectly yet powerfully.

Compared to conventional learning methods, this media offers a transformative approach. Whereas students previously relied solely on teachers' verbal and textual explanations, they can now learn through scenarios, experimentation, exploration, and direct feedback. In this sense, visual communication design does not merely support the content of instruction but becomes a central component in the system of meaning delivery.

The findings of this study are also consistent with previous research emphasizing the significance of interactive visual media in elementary education. The mobile-based edugame, designed with careful attention to visual and interactive aspects, proved effective in improving student learning outcomes. This reinforces the position of Visual Communication Design as a strategic field in digital-based learning innovation (Windawati & Koeswanti, 2021).

Considering these aspects, the Anggah Ungguhing Basa Bali edugame not only fulfills the criteria of being an effective and efficient learning medium but also demonstrates how visual communication design can serve as a bridge between technology, culture, and elementary education (Siregar et al., 2024). This interdisciplinary integration illustrates that design is not merely about fine arts or aesthetics, but also a tangible tool for social and cultural transformation in the context of 21st-century education.

Conclusion

This study concludes that the interactive mobile-based edugame Anggah Ungguhing Basa Bali is effective in improving students' comprehension, as shown by the significant increase in average scores from 40.9 (pre-test) to 91.3 (post-test) and the high feasibility ratings from experts and users. The media successfully addressed the limitations of conventional methods, especially in teaching complex and socially sensitive linguistic structures.

Beyond its function as a learning tool, the edugame also contributes to the preservation of Balinese culture. Through contextual and child-friendly visual communication design, cultural values were presented in engaging and meaningful ways, making the learning process not only informative but also culturally relevant.

Based on the findings, teachers are encouraged to adopt digital-based media such as edugames as part of their instructional strategies, while media developers and designers should continue integrating cultural and pedagogical aspects into future innovations. Schools and education authorities are also recommended to support culture-based digital learning initiatives. Further research should expand sample sizes, examine long-term retention, and develop richer gamification features or integrate technologies such as AI and augmented reality.

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