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Innovative Solution for BIPA: Enhancing Reading Skills and Cultural Understanding through Interactive Multimedia

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ABSTRACT

This research addresses the low reading ability of beginner-level BIPA students in understanding Indonesian cultural materials, attributed to complex vocabulary, grammar, and contextual themes. It analyzes the feasibility, practicality, and effectiveness of interactive multimedia integrated with a self-directed learning model to enhance reading skills and cultural understanding. Using a quantitative experimental approach with a one-group pretest-posttest design, 30 A1-level BIPA students were selected through purposive sampling. Data were collected via expert validation, practicality questionnaires, and culture-based reading tests. Results indicate: (1) high feasibility by media (3.81/4) and material experts (3.56/4); (2) very high practicality ratings by lecturers (3.72/4) and students (3.56/4); and (3) moderate effectiveness (N-gain 0.63), with average scores rising from 62.33 (pre-test) to 86.16 (post-test). The study concludes that pedagogically designed interactive multimedia strengthens linguistic and cultural competencies through contextual content, intuitive design, and self-directed learning flexibility. This model offers an innovative, adaptive solution for technology-based language education in cross-cultural contexts.

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1. INTRODUCTION

Bahasa Indonesia bagi Penutur Asing (BIPA) program is an initiative by the Ministry of Education, Culture, Research, and Technology aimed at developing Indonesian language competence, including speaking, writing, reading, and listening skills, for foreign speakers. As a flagship program of the Indonesian government, BIPA has demonstrated success in globalizing the Indonesian language (Sambas et al., 2022). Through BIPA, individuals from various countries can learn Indonesian intensively and deeply, which leads to good understanding and mastery (Muzaki, 2021). The BIPA program plays a key role in efforts to internationalize the Indonesian language (Nurhuda et al., 2023).

Indonesia has become one of the countries with a significant number of foreign residents, including international students. According to the Ministry of Research, Technology, and Higher Education (Kemenristekdikti) in 2019, there were 20,000 international students in Indonesia. Consequently, Indonesian has become a language that must be learned by these students. Foreign nationals can access Indonesian language learning through BIPA teaching institutions. Indonesia can leverage the BIPA program to establish its language and culture as a vital component of the global discourse, with the aim of promoting peace, intercultural comprehension, and harmonious international relations (Widiyanti et al., 2024).

The Indonesian Language for Foreign Speakers (BIPA) program at Yogyakarta State University (UNY) faces challenges in improving the reading skills of its students. Data analysis from the 2023 initial reading tests of BIPA students at UNY revealed scores ranging between 30 and 65, with a minimum score of 30 and a maximum of 65. These scores fall significantly below the passing standard of 75, indicating that most participants lack the expected reading proficiency to graduate. This situation underscores the need for more intensive interventions to enhance students' reading abilities to meet the established requirements.

A needs analysis conducted among 30 beginner/A1-level BIPA students at UNY in 2023 revealed a strong preference for multimedia-based learning. Approximately 83% of respondents expressed a desire for learning materials that integrate text, images, videos, and audio. Conversely, 63% of students reported

difficulties in reading courses focused on Indonesian cultural topics. The primary challenges identified were vocabulary complexity (93%), difficulties with grammatical structures (90%), and themes perceived as too heavy (67%). These findings support the recommendation to develop interactive multimedia learning tools that combine audio, visual, and textual elements as a strategic solution to improve students' reading skills, particularly in understanding Indonesian cultural materials. To create effective and relevant learning materials for BIPA participants, a needs analysis must be performed as a starting point (Prasetyo, 2019).

The low reading proficiency in BIPA programs is a common challenge faced by many institutions. At UNY, the implementation of learning strategies has not been optimal in enhancing the reading competence of international students. Observational data from 2023 showed that 10 out of 15 beginner/A1-level BIPA students still struggled to comprehend texts on Indonesian cultural themes. This highlights a gap between actual learning outcomes and the set targets. Cultural aspects are crucial for achieving BIPA learning objectives (Tanwin & Rosliani, 2020).

Self-directed learning is considered an effective method for developing BIPA students' reading skills. In this approach, students have full authority to manage their learning process. According to Knowles (1975), self-directed learning is defined as an individual's effort, either independently or with external support, to identify learning needs, design learning strategies, implement them, and evaluate learning outcomes independently. This concept emphasizes the importance of active student participation in managing their learning to achieve competency goals flexibly and responsibly, fostering independence and sustainability in mastering reading skills.

Self-Directed Learning (SDL) is a learner-centered model that encourages increased interest in learning while providing opportunities for students to explore problems independently. Zamnah & Ruswana (2018) define SDL as an approach where learners actively design, execute, and evaluate their own learning processes. SDL is characterized by learners setting learning goals, planning, selecting resources, and assessing their progress with full participation (Brockett & Hiemstra, 2018).

The self-directed learning model in BIPA can be adopted as an alternative approach to language teaching(Mawaddah et al., 2021). This model offers flexibility for learners to manage their learning process independently. In its implementation, students are required to take initiative and be self-reliant in understanding BIPA materials, where language mastery success heavily depends on individual discipline and commitment. Through the integration of interactive multimedia, such as a combination of text, audio, and visuals, the BIPA self-directed learning model is expected to create an adaptive, interactive, and supportive learning environment that fosters holistic language competency development. This collaboration is believed to strengthen learning motivation and facilitate the effective achievement of learning objectives. The Self-Directed Learning (SDL) approach can be adapted as a relevant strategy aligned with the diverse competencies to be developed (Charokar & Dulloo, 2022).

The BIPA program at UNY integrates Indonesian cultural and daily life materials into its curriculum. One approach used is leveraging local culture, referring to the traditions, values, or practices specific to certain regions or communities in Indonesia, as a communication tool for foreign speakers. Local culture is chosen for its relevance in building contextual understanding and facilitating more authentic interactions in the language learning process. Therefore, introducing Indonesian culture in BIPA learning becomes a crucial component that participants must master. BIPA is essential in the globalization era, it serves as a strategic instrument for internationalizing the Indonesian language, spreading Indonesian culture, and reinforcing diplomatic and economic connections with the global society (Ramadloni, 2022; Sari et al., 2021)

Self-directed learning requires the use of appropriate media, one of which is interactive multimedia. According to Surjono (2017), interactive learning multimedia is a technology-based system that integrates text, images, graphics, audio, video, animations, and simulations cohesively. This program is designed to allow users to interact actively through navigation, responses, or content exploration to achieve learning objectives. The combination of multimedia elements aims to create an engaging, adaptive, and individualized learning experience, thereby enhancing the effectiveness of the self-directed learning process. Learning media plays a crucial role in driving educational progress, as the nature of the teaching and learning process itself is communicative and interaction-based (Afnita et al., 2023).

Several forms of innovative teaching materials have emerged, including web-based interactive learning platforms and educational applications (Setiawan & Basyari, 2017). The current transformation in the education system also reflects a paradigm shift: from reliance on conventional materials like printed textbooks to the utilization of digital content, including e-books and interactive multimedia using applications like Adobe Flash (Shobrina et al., 2020). Setiawan et al., (2024) developed an interactive digital module aimed at introducing and enhancing students' understanding of Indonesian local culture, including traditions, arts, and social values. Students not only learn the Indonesian language but also gain a deeper understanding of Indonesian culture, particularly the local values associated with the city of Cirebon. BIPA instructional

materials are created to provide a solid foundation in the Indonesian language, focusing on vocabulary, grammar, and the development of speaking, listening, reading, and writing abilities (Proklawati et al., 2021).

Research by Fidianingsih & Muhtadi (2021) proves that the use of media is effective in improving reading comprehension. Similar findings were reinforced by Agatha et al. (2024), demonstrating that the utilization of media in BIPA learning not only enhances comprehension but also significantly boosts student engagement. Furthermore, the integration of media into the learning process has been shown to positively impact learners' interest and motivation in acquiring Indonesian language proficiency. These findings further emphasize the crucial role of technology and media as teaching tools capable of creating more engaging and meaningful BIPA learning experiences.

One of the key strengths of interactive multimedia lies in its flexibility, allowing learners to adjust the timing, methods, and pace of learning according to individual needs. Given these numerous advantages, both educators and learners can optimally utilize multimedia to develop listening skills, whether in classroom settings or self-directed learning outside the classroom (Astuti & Bewe, 2020).

This study aims to analyze the feasibility, practicality, and effectiveness of interactive multimedia-based learning media integrated with a self-directed learning model in improving Indonesian language reading skills and cultural understanding among beginner/A1-level BIPA students at Yogyakarta State University (UNY). The beginner/A1 level was chosen because the majority of BIPA students are at this proficiency level (Suyitno et al., 2019). The developed media aims to create a flexible, interactive, and learner-centered learning environment while strengthening the context of Indonesian culture through contextual learning materials.

2. METHOD

This study implements a quantitative experimental approach with a Quasi-Experimental design to evaluate the practicality and effectiveness of interactive multimedia products in beginner-level (A1) BIPA learning. This method was chosen to measure the impact of media intervention on individual skill improvement without involving a control group, thereby simplifying the design complexity in the context of specific learning (Sugiyono, 2019). The research subjects involved A1-level BIPA students at Yogyakarta State University (UNY) as the primary participants, with a focus on comparing pre-test and post-test results.

The measurement of practicality was conducted through two stages: (1) The alpha testing phase involved subject matter experts, media experts, BIPA students, and a BIPA instructor to evaluate the initial design and content validity, including 1 content expert (a lecturer in Indonesian Language and Literature Education at Universitas Negeri Yogyakarta specializing in BIPA methodologies), 1 media expert (a lecturer in Educational Technology at UNY with expertise in multimedia design), 7 beginner-level (A1) BIPA students from UNY to assess usability, and 1 BIPA instructor to evaluate pedagogical effectiveness. (2) The beta testing phase focused on larger-scale usability testing with a new group of A1-level BIPA students who had not participated in the alpha test to ensure unbiased feedback on functionality and learning outcomes. Prior to development, a needs analysis was conducted with A1-level BIPA students at UNY to identify key challenges, preferences, and learning gaps that guided the multimedia design process

The data obtained from interviews with BIPA (Indonesian for Foreign Speakers) instructors were analyzed using qualitative descriptive techniques, where the results were summarized and used as the basis for product development. Meanwhile, data from the student needs analysis questionnaire were processed by calculating the percentage of each response using the formula:

$$P=f/N\times100\%$$

Where:
P = Percentage score
f = Total score obtained
N = Maximum possible score

To analyze product feasibility, the first step was calculating the average score from each respondent. Next, the feasibility criteria were determined based on a 4-point scale conversion referring. The ideal maximum score was 4, while the ideal minimum score was 1. The ideal mean (Xi) was calculated using the formula:

$$Xi = \frac{maximum\ score+minimum\ score}{2} \quad (1)$$

and the standard deviation (SBi) was calculated using:

$$SBi = \frac{maximum\ score-minimum\ score)}{6} \quad (2)$$

The conversion results were then classified into four categories: highly feasible ($3.25 \leq x \leq 4.00$), feasible ($2.50 \leq x < 3.25$), less feasible ($1.75 \leq x \leq 2.50$), and not feasible ($1 \leq x < 1.75$). A product was deemed feasible if it met the minimum criteria within the "feasible" interval.

The effectiveness of the product was measured by comparing pre-test and post-test scores, which assessed the improvement of reading skills and cultural understanding. Data were analyzed using the N-gain method to quantify the level of media effectiveness. This approach allowed researchers to objectively identify the impact of the intervention, while also ensuring the validity of the results in a measurable learning context. Data on the improvement of language competence and cultural understanding were analyzed using normalized gain (N-gain) based on Hake's formula:

$$g = \frac{Spost - Spre}{Smaks - Spre} \quad (3)$$

Descriptions:
Spost = Post-test score
Spre = Pre-test score
Smax = Maximum score

The N-gain value was then interpreted to determine the improvement in students' reading comprehension skills after using the BIPA interactive multimedia.

3. RESULTS AND DISCUSSION

3.1. Results of Alpha Testing

The feasibility validation of the BIPA interactive multimedia product was conducted by media experts. The evaluation covered five main aspects: (1) the program's introductory structure, (2) clarity and systematic presentation of information, (3) user control and ease of navigation, (4) availability of help features, and (5) application of multimedia design principles (such as visual balance and audio-visual integration). The average score obtained from the media evaluation was 3.81 out of 4, falling within the interval $3.25 \leq 3.81 \leq 4.00$, which categorizes the product as "Very Feasible". This indicates that the BIPA interactive multimedia meets media feasibility standards and is suitable for use in learning. The evaluation reflects the quality of technical design, interactivity, and adherence to multimedia principles in supporting self-directed learning for BIPA students.

The feasibility of the Indonesian language content was assessed by material experts, who evaluated various critical aspects of learning. These aspects included the alignment of the material with learning objectives, content quality, language use, presentation techniques, effectiveness in enhancing motivation, provision of feedback, and the media's ability to adapt to user needs. The BIPA interactive multimedia product received an average score of 3.56 on a scale of 1-4, falling within the range $3.25 \leq 3.56 \leq 4.00$. This score places the product in the "Very Feasible" category in terms of learning material substance. Thus, the content presented is deemed to meet the feasibility standards for use in beginner-level BIPA learning. However, based on qualitative feedback from material experts, several improvement recommendations were suggested before the product is widely used. Revisions focus on refining the material presentation structure, enhancing contextual examples, and optimizing feedback to ensure alignment with learners' needs.

Seven students from the beginner-level BIPA reading class at UNY provided feedback after testing the developed interactive multimedia. The evaluation covered five main aspects: (1) language use, (2) relevance of content, (3) quality of information presentation, (4) graphic design, and (5) ease of media use. The average score obtained was 3.56 on a scale of 1-4, falling within the interval $3.25 \leq 3.56 \leq 4.00$. This score categorizes the product as "Very Practical", indicating that students consider the media suitable as a learning support tool. Overall, students provided positive feedback, stating that the program is "already good" and "helps the learning process." They highlighted the strengths of the media, such as intuitive navigation, engaging visuals, and content that aligns with beginner-level learning needs. However, minor suggestions were made regarding the addition of interactive examples and increased exercise variety to strengthen understanding.

The course lecturer provided comprehensive feedback after testing the developed BIPA interactive multimedia. The evaluation focused on five main aspects: (1) language use, (2) quality of content, (3) systematic presentation of information, (4) graphic design, and (5) ease of media use. Based on quantitative analysis, the product received an average score of 3.72 on a scale of 1-4, falling within the interval $3.25 \leq 3.72 \leq 4.00$. This score places the multimedia in the "Very Practical" category, indicating that the media is deemed suitable and effective for supporting the learning process.

Based on the overall alpha testing, the developed BIPA interactive multimedia product is considered feasible and practical as a self-directed learning resource for improving reading comprehension skills in

Indonesian cultural materials. This assessment is based on alpha testing results showing an average score above 3.5 on a scale of 4, covering media aspects (3.81), material aspects (3.56), lecturer feedback (3.72), and student feedback (3.56).

3.2. Results of Beta Testing

The beta testing of the BIPA interactive multimedia product was conducted in three class sessions involving 30 students from the beginner-level BIPA reading class at UNY, aiming to evaluate the media's effectiveness in improving reading comprehension skills for Indonesian cultural materials. In the first session, students completed a pre-test to measure their initial ability to read Indonesian cultural texts, followed by downloading and learning to use the interactive multimedia through provided guidelines, where they began interacting with learning modules featuring text, audio, and interactive exercises. During the second session, students engaged in intensive self-directed learning by accessing various content, such as cultural dialogue simulations, contextual quizzes, and visual materials about Indonesian traditions, while the researcher monitored user activity logs to ensure student engagement and identify any technical issues. In the third session, students completed a post-test to assess their reading skill improvement after using the multimedia, with post-test questions designed to align with the pre-test, covering aspects such as cultural text analysis, interpretation of meaning, and application of new vocabulary to measure the media's effectiveness in supporting students' reading comprehension.

In both tests, students answered 20 multiple-choice questions with comparable difficulty levels in each session, with the questions designed based on learning indicators and question types found in the textbook, which served as the primary material source.

The complete results of the pre-test and post-test can be seen in Table 2, which displays the average scores of the pre-test and post-test.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	30	20.00	80.00	62.3333	18.87953
Post-test	30	75.00	100.00	86.1667	8.874930
Valid N (listwise)	30				

Based on Table 2, the average score of students in the pre-test was 62.33. This average score is below the minimum passing criteria for BIPA reading, which is 75. The minimum score obtained was 20, while the maximum score was 80. Meanwhile, the average score of students in the post-test was 86.16, with a minimum score of 75 and a maximum score of 100. Based on this average score, students have achieved the passing standard for reading skills in Indonesian cultural materials.

Table 3 and Figure 1 show the frequency distribution of pre-test scores. The majority of students, 26.7%, scored 75. In the pre-test, 15 students had already achieved the score of 75 or the minimum passing criteria.

Table 3. Frequency Distribution of Pre-Test Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20.00	2	6.7	6.7	6.7
	30.00	2	6.7	6.7	13.3
	40.00	2	6.7	6.7	20.0
	50.00	2	6.7	6.7	26.7
	55.00	1	3.3	3.3	30.0
	60.00	2	6.7	6.7	36.7
	65.00	3	10.0	10.0	46.7
	70.00	2	6.7	6.7	53.3
	75.00	8	26.7	26.7	80.0
	80.00	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

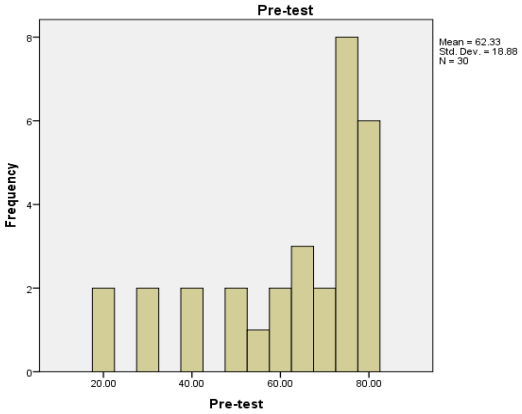

Figure 1. Frequency Distribution of Pre-Test Scores

Based on the data in Figure 1, the average pre-test score of the students was 62.33, with the lowest score being 20 and the highest score being 80. This score is below the minimum passing standard (KKM) for BIPA reading skills, which is 75, indicating that most students had not yet mastered the basic competencies before the multimedia intervention.

After undergoing interactive multimedia-based learning, the average post-test score increased significantly to 86.16, with a score range of 75–100. This achievement demonstrates that all students have exceeded the KKM and met the passing criteria for reading skills in Indonesian cultural materials.

Table 18. Frequency Distribution of Post-Test Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	75.00	7	23.3	23.3	23.3
	80.00	5	16.7	16.7	40.0
	85.00	5	16.7	16.7	56.7
	90.00	4	13.3	13.3	70.0
	95.00	5	16.7	16.7	86.7
	100.00	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

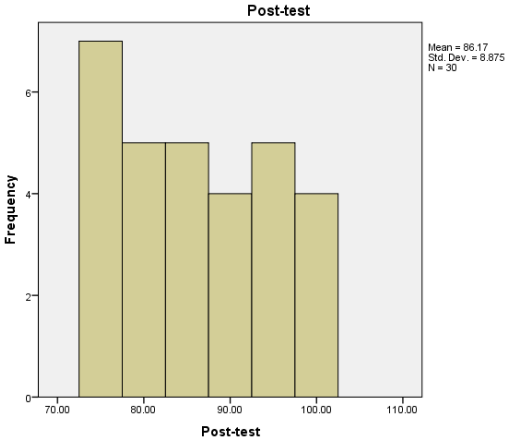

Figure 2. Frequency Distribution of Post-Test Scores

To evaluate the effectiveness of the interactive multimedia in improving reading skills, the pre-test and post-test scores were analyzed using the normalized gain method. The results of this calculation, which illustrate a significant improvement in reading comprehension. The normalized gain score was calculated to be 0.63.

DISCUSSION

In the initial stage of developing BIPA interactive multimedia using Adobe Flash, the product was designed by considering three key aspects: (1) alignment with the existing BIPA curriculum, (2) the characteristics of beginner/A1-level BIPA students at UNY (such as the need for simple and contextual learning), and (3) contemporary learning challenges, such as adapting cultural materials into a digital format. The design process included the creation of thematic content, integration of colorful graphic visuals, and the development of interactive assessment tools based on character. The initial prototype was then tested on a limited scale with students and lecturers to gather feedback on content accuracy, language clarity, interface design, and ease of navigation. This feedback served as the basis for refining the product, resulting in a practical media tool aligned with the principles of self-directed learning, which emphasizes self-management, intrinsic motivation (desire for learning), and self-regulation (Handayani, 2017).

The feasibility analysis of the BIPA interactive multimedia, based on evaluations by media and material experts, was categorized as "Very Feasible" and "Very Practical". The evaluation considered five main aspects: (1) adequate program introduction structure, (2) clarity and systematic presentation of information, (3) ease of access and user navigation control, (4) availability of help features for learning guidance, and (5) application of multimedia principles such as visual balance, audio-visual integration, and interactivity. The high scores reflect that the product meets technical and functional design standards, making it suitable for implementation as a technology-based learning medium for beginner-level BIPA competencies. These findings align with Astuti (2020) research, which states that well-structured media and learning materials can produce high-quality multimedia products while enhancing learners' linguistic competencies. Furthermore, Anggraini & Sartono (2019) study reinforces that interactive multimedia is suitable as a learning tool, especially for abstract content like nationalistic values, thanks to its ability to effectively visualize complex concepts.

The development of Adobe Flash-based BIPA interactive multimedia as a learning medium was designed by integrating key elements aligned with educational multimedia design principles. According to Thamwipat et al., (2019), multimedia is a dynamic combination of text, visuals, audio, video, and interactive features optimized to enhance communication effectiveness and learning efficiency. Recent research by Alfarobby et al., (2024) strengthens these findings by demonstrating the effectiveness of interactive platforms in BIPA learning, marked by an 80% active participation rate and full learning mastery (100%).

The initial field trial to assess the practicality of the BIPA interactive multimedia involved a questionnaire completed by 7 students and a lecturer. The assessment aspects included content quality, language accuracy, interface design, material presentation, and ease of media use. The results showed that students gave an average score of 3.56 (on a scale of 1-4), while the lecturer gave a score of 3.72, both falling into the "Very Practical" category. These findings indicate that the media meets high practicality criteria based on direct user perspectives. The practicality of the media not only ensures clear and structured information delivery but also strengthens learning effectiveness through intuitive and self-directed learning-oriented design. Practical media makes messages and information clearer, facilitating and improving the learning process and outcomes (Irawan & Hakim, 2021).

Based on positive feedback from students and the lecturer regarding the ease of using interactive multimedia in learning, the Adobe Flash-based BIPA interactive multimedia has proven to meet practicality criteria. These findings are consistent with Ahmadi et al., (2019) research indicating that E-BIPA teaching media has been assessed as effective in improving learning results, due to its well-suited content and media, and the favorable feedback received from teachers and students.

The BIPA interactive multimedia has proven effective in improving reading comprehension skills for Indonesian cultural materials. A beta test using a one-group pretest-posttest design showed a significant increase, from an average score of 62.33 to 86.16 (a difference of 23.83 points). These results confirm that Adobe Flash-based interactive media successfully simplifies complex materials and serves as an effective self-directed learning tool, even for students with low initial abilities, as all post-test scores exceeded the minimum passing standard (KKM). This aligns with the findings of Lestari et al., (2019), which demonstrate that the use of interactive multimedia strengthens learners' understanding in BIPA learning.

Based on calculations using normalized gain, the BIPA interactive multimedia showed a moderate effectiveness level with a gain score of 0.63. This score proves that the multimedia is effective in improving students' reading comprehension skills for Indonesian cultural materials. In other words, the multimedia successfully helps students improve their understanding, albeit within a moderate effectiveness category. These findings align with research, which showed the high effectiveness of multimedia in improving reading comprehension of historical recount texts. The conclusion regarding the effectiveness of BIPA interactive multimedia is also supported by other studies Alfarobby et al., (2024), which confirm that interactive multimedia is effective in enhancing reading skills in Indonesian language learning.

Based on the research results, the BIPA interactive multimedia has proven effective in improving the reading skills of beginner/A1-level BIPA students at UNY. This is supported by the significant improvement

in pre-test and post-test results. Thus, this multimedia can be considered an effective learning tool for enhancing reading comprehension skills in BIPA learning contexts. It is hoped that the use of BIPA interactive multimedia in BIPA reading instruction can improve students' reading abilities, as this multimedia offers added value in creating a more entertaining and enjoyable learning atmosphere. "The findings here correspond to research done by Ratnasari (2021) where the Indonesian listening learning media, designed with Adobe Flash CS5, was assessed as 'very good' by media experts, achieving an average score of 4.6. This verifies the media's validity for use by BIPA learners. In general, this innovation contributes positively to the education of Indonesian language for foreign speakers (BIPA), leading to a more attractive and effective learning experience (Zahra & Rahman, 2024)

4. CONCLUSION

This study demonstrates that the integration of pedagogically principled interactive multimedia in BIPA learning effectively strengthens linguistic competence and cultural understanding. The combination of interactive elements, intuitive design, and contextual relevance facilitates self-directed learning and the holistic internalization of cultural values. The success of this media depends on the alignment between technical design, learning needs, and learner characteristics. Theoretically, these findings enrich the paradigm of technology-based language learning by balancing content structure, interactivity, and cultural adaptation, making it an innovative model for other language contexts. In practice, this approach not only addresses the challenges of beginner level BIPA learning but also offers a dynamic solution for connecting language mastery with cultural literacy through digital transformation. The implications of this research highlight the potential of interactive multimedia as a transformative tool in language education, particularly in bridging linguistic and cultural competencies. By leveraging digital innovation, this approach provides a flexible and engaging learning environment that caters to the diverse needs of BIPA learners, ultimately fostering a deeper connection to Indonesian language and culture. Future studies should expand to include diverse proficiency levels (A1-C2) and cultural backgrounds, incorporate longitudinal assessments of knowledge retention, and explore adaptive learning technologies along with AR/VR applications. Researchers should examine the model's applicability to other languages while maintaining linguistic-cultural balance, foster international collaborations for cross-cultural validation, and employ mixed-methods designs to better understand cognitive-affective learning dimensions. These approaches would strengthen technology-enhanced BIPA pedagogy and contribute to digital language education.

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