Al-Madrasah: Jurnal Ilmiah Pendidikan Madrasah Ibtidaiyah
Vol. 10, No. 4, 2026
DOI 10.35931/am.v10i4.6360
P-ISSN: 2620-5807; E-ISSN: 2620-7184

DEVELOPMENT OF *AN* AR-BASED *READING LENS FLASHCARD* FOR READING AT THE BEGINNING OF GRADE 1 OF SDN LEYANGAN UNGARAN

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Abstract

Low early reading skills in lower-grade students pose a significant challenge to basic literacy, necessitating innovative learning media that adapt to technological advancements. This research aims to develop Augmented Reality (AR)-based "Lensa Baca" flashcard media for 1st-grade students at SDN Leyangan Ungaran, and to test its validity, feasibility, and effectiveness. The research method used is Research and Development (R&D) with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The research subjects consisted of 31 first-grade elementary school students. The validity of the instrument was tested using Aiken's V formula by content experts and language experts. The media's feasibility was measured thru questionnaires completed by teachers and students, while its effectiveness was tested using a One-Group Pretest-Posttest design with statistical analysis using the Wilcoxon Signed Rank Test and N-Gain Score. The research results showed that the Lensa Baca media was declared very valid and suitable for use, with an average user response percentage reaching 90-95%. The Wilcoxon test results showed a significance value of 0.000 < 0.05, indicating a significant difference in students' reading abilities before and after the treatment. The average N-Gain value of 0.65 placed this media in the "Moderate" effectiveness category. Thus, the AR-based Lensa Baca flashcard media is proven to be feasible and effective as an interactive supplementary tool for early reading instruction in elementary schools.
Keywords: Augmented Reality, Flashcards, Word Method, Beginning Reading


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INTRODUCTION

There are two reading skills taught at the elementary level, namely beginning reading and continuing reading.[1] In reading the poem, students are helped to recognize letters, spell syllables until a word is formed and read simple sentences. According to Jean Piaget, 1st grade elementary school students are at a concrete operational stage, which is easier to understand concrete concepts than abstract.[2] Therefore, the implementation of interesting learning media, such as the use of pictures, word games, interactive visual media, and utilizing technology.

The achievement of the Indonesian language in the decision of the Ministry of Education and Culture on the elements of reading and watching grade 1 elementary school reads *"students are able to read everyday words fluently".* Grade 1 elementary school is able to memorize the letters of the alphabet outside their heads, spell syllables, and read everyday words fluently.[3] Teachers create new innovations, learning media that are adapted to the needs and developments of the times.[4] Technology in the form of learning media will help achieve the goal of beginning reading in grade 1 elementary school and improve the quality of learning in the digital era.

However, there is a real gap between the demands of learning outcomes and the factual conditions in the field**.** In fact, many elementary schools in Indonesia still have difficulties in achieving the achievement of beginning reading as stipulated in the curriculum policy. This shows that the initial reading ability of grade I students has not fully developed according to the expected standards. This gap is reinforced by the empirical findings of Pramudikasari and Shintiana that the majority of early childhood still have difficulty distinguishing similar letters.[5] In addition, research by Huduni, some children have difficulty recognizing letters so that it can hinder the learning process of reading at a higher level.[6]

In line with previous research, the results of interviews and observations at SDN Leyangan, Ungaran, showed that grade I students still had difficulties in recognizing the letters of the alphabet,

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[1] ulfiatul inka Aprilia, Fathurohman, and Purbasari, "Analisis Kesulitan Membaca Permulaan Siswa Kelas I," *Penelitian Dan Pengembangan Pendidikan* 5, no. 2 (2021).

[2] Alwisia Meo, Maria Patrisia Wau, and Yosefina Uge Lawe, "Analisis Kesulitan Belajar Membaca Permulaan Pada Siswa Kelas I SDI Bobawa Kecamatan Golewa Selatan Kabupaten Ngada," *Jurnal Citra Pendidikan* 1, no. 2 (2021), https://doi.org/10.38048/jcp.v1i2.247; Meo, Wau, and Lawe.

[3] Nadila Resti Cahyanti, Nanda William, and Wahyu Nurmalasari, "Pengembangan Media Pembelajaran E-Flashcard Untuk Meningkatkan Keterampilan Membaca Permulaan Peserta Didik Kelas 1 Sekolah Dasar," *Jurnal Elementaria Edukasia* 6, no. 4 (2023), https://doi.org/10.31949/jee.v6i4.6160.

[4] Nadhirotuz Zulfah, "Pemanfaatan Media Game Edukasi Wordwall Untuk Meningkatkan Minat Belajar Siswa," *Pubmedia Jurnal Penelitian Tindakan Kelas Indonesia* 1, no. 1 (2023), https://doi.org/10.47134/ptk.v1i1.5.

[5] Agatha Kristi Pramudika Sari and Shinta Shintiana, "Analisis Kemampuan Membaca Permulaan Dan Kesulitan Yang Dihadapi Siswa Kelas 1 Sekolah Dasar," *Jurnal Lensa Pendas* 8, no. 2 (2023), https://doi.org/10.33222/jlp.v8i2.2818.

[6] Awanisul Huduni, Lalu Hamdian Affandi, and Khairun Nisa, "Analisis Kesulitan Siswa Dalam Membaca Permulaan Di Kelas 1 SD Negeri 3 Darek," *Jurnal Ilmiah Profesi Pendidikan* 7, no. 2 (2022), https://doi.org/10.29303/jipp.v7i2.488.

spelling syllables, and reading simple words. Early reading learning is still supported by conventional media that does not keep up with technological developments. Limited school facilities, teachers' skills in technology-based innovation, and lack of time for self-development are factors that hinder the creation of interesting and effective learning.

Some of the studies conducted by previous researchers that have linearity with this study, delivered by Elvina, media *flashcard with QR Code* which can be scanned to display learning videos related to the content of the image is considered effective for early childhood reading.[7] Research by Cahyani, that the use of technology *Augmented Reality (AR)* in education shows that *AR* is an effective and engaging innovative learning medium, especially at the primary and intermediate levels.[8] Research by Sureni and Ibn Muthi explains that the syllable method is a way of introducing the formation of words through the combination of several letters.[9]

Previous research has not shown that there is a learning media that integrates flashcards, augmented reality (AR), and word methods simultaneously, especially in the learning of Indonesian language in grade I of elementary school. In general, AR-based media is more developed for the high grade level and is dominated by science subjects. In addition, the application of AR to early reading learning is still relatively limited. This condition shows that there is a research gap that has not been widely studied in the context of early learning to read.

Based on these conditions, an Augmented Reality (AR)-based interactive flashcard learning media called Reading Lens was developed which integrates the word method in an integrated manner. This media is designed to be simple, accessible, and concrete through flashcards that display 3D visuals, animations, and audio when scanned using a device. In addition, flashcards are arranged in three levels of reading ability so that they are able to accommodate different abilities of students. Thus, Lensa Baca becomes an innovation in Indonesian language learning media that is more adaptive and effective for the beginning reading skills of grade I elementary school students.

This research is expected to be useful for students in improving their initial reading skills through a concrete and interesting approach and developing digital literacy. For teachers and schools, this research provides interactive learning alternatives and supports the improvement of technology-based learning quality. In addition, this research provides applicative experience for

[7] Tri Elvina, Dian Miranda, and Lukmanulhakim Lukmanulhakim, "Pengembangan Flashcard Tematik Berbasis Augmented Reality Anak Usia 5-6 Tahun," *Jurnal Edukasi* 2, no. 1 (2024), https://doi.org/10.60132/edu.v2i1.256.

[8] Aulia Dwi Cahyani, Ninik Suryani, and Lilis Nurlaela, "Pengembangan Media Pembelajaran Augmented Reality Sebagai Inovasi Pendidikan," *Jurnal Inovasi Teknologi Pendidikan* 10, no. 2 (2023).

[9] Sureni Sureni and Ibnu Muthi, "Peningkatan Kemampuan Membaca Siswa Kelas I SD Melalui Suku Kata Pada Mata Pelajaran Bahasa Indonesia," *Katalis Pendidikan : Jurnal Ilmu Pendidikan Dan Matematika* 2, no. 3 (2025), https://doi.org/10.62383/katalis.v2i3.2148.

researchers as well as scientific contributions in the development of educational innovations in elementary schools.

The purpose of this study is to develop *an* AR-based interactive *flashcard-based* learning media using a word method called *Reading Lens* for the initial reading skills of 1st grade students of SDN Leyangan. This study also tested the practicality and effectiveness of *AR-based Reading Lens flashcards* for early reading in grade 1 of elementary school. The presence of a learning media called Reading Lens will make it easier for teachers to overcome existing problems and to improve the quality of reading learning in elementary schools and support the achievement of basic literacy competencies optimally.

RESEARCH METHODS

The research method used uses the research and development method. The research and development method *aims* to develop and test the effectiveness of products through systematic research steps.[10] The development model used is the ADDIE model which is modified according to the needs of the research. ADDIE's steps include *Analysis, Design, Development, Implementation, Evaluation*. Therefore, systematics starts from the analysis of the needs of the research subject to testing the effectiveness of the product which has been adjusted to the initial purpose of creating a product. The subjects of this study are all students of SDN Leyangan Ungaran totaling 31 students. The data began with interviews, observations, validation of media, language, and material experts, followed by pretest and post test data collection, student and teacher response questionnaires. The data analysis techniques used are divided into expert validation data using Aiken's test, a feasibility test for student and teacher responses. Pretest and *post test* data analysis using *the SPSS 27* application in the form of normality test, wilcoxon signed rank test and n-gain test using excel.

RESULTS AND DISCUSSION

A. Development of *AR-Based Reading Lens Flashcards*

The development of Reading Lens learning media is carried out systematically through the ADDIE model, namely *Analyze, Design, Development, Implementation, Evaluation.* The analysis revealed the urgency of media development due to the gap between the demands of the Independent Curriculum and the reality of the low reading ability of students in grade 1 of SDN Leyangan Ungaran. The limitations of media that have not utilized interactive technology cause students to get bored quickly and find it difficult to focus on understanding concrete material. Therefore, the

[10] Sugiyono, *Metode Penelitian Kualitatif, Kuantitatif, Dan R&D* (Bandung: Alfabeta, 2019).

development of *AR-based "Reading Lens" flashcards* is a crucial need to integrate concrete media with 3D and audio technology.

In the design and development stage, which produces 15 concrete Augmented Reality-based flashcards divided into three ability levels (five cards each), content differentiation occurs. At level 1, it is specifically for students who are still in the beginner stage so that words without dead letters are presented. Level 2 is presented with a word with one dead letter at the end of the word. And level 3 is presented with 2 dead letters in the middle and at the end of the word. This serves to find out the improvement and focus students in learning. This process includes designing an interactive flashcard prototype that integrates engaging visual elements as well as camera scanning features to trigger direct student interaction with AR technology. Prior to widespread use, the product underwent a series of validations by subject matter experts and media experts, as well as one-to-one tests to ensure that the technical aspects and substance of the material have been revised to reach optimal feasibility standards.

At the implementation and evaluation stages, the "Reading Lens" media is applied in real learning practices to measure the significant impact on initial reading skills. The effectiveness of the product was measured through a comparison of *pretest* and *posttest results* supported by the collection of response questionnaires from teachers and students. The results of this final evaluation not only prove the ability of the media to improve pronunciation and letter recognition, but also the sustainability of the use of interactive technology. The following are the final results of the development of Reading Lens media:



Image 1. Wrap *Flashcard* Reading Lenses



Image 2. Student Instructions



Image 3. Teacher's Instructions



Image 4. Front (Level 1, Level 2, Level 3)

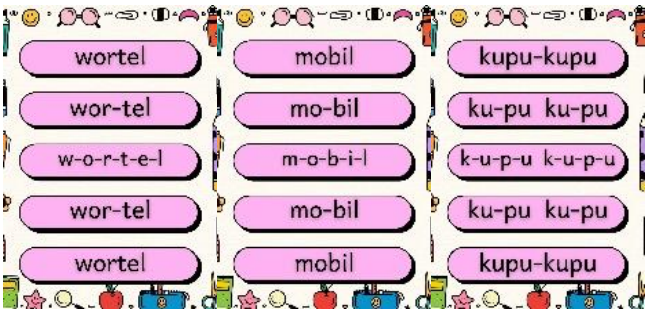


Image 5. Back (Level 1, Level 2, Level 3)

B. Reading Lens Qualification as a Learning Media in Beginner Reading

The feasibility of learning media is assessed through a member test stage involving media members, material experts, and linguists. In addition, the feasibility of Reading Lens learning media can also be assessed through the analysis of user response questionnaires in small groups, students, and teachers. The media validity and feasibility test aims to determine the suitability, feasibility, and accuracy of the content in the developed product. The media validation test was carried out by experts which was then analyzed using Aiken's V calculation according to Aiken. In contrast to the

analysis of user questionnaires, both from small groups, students, and teachers using the percentage of eligibility mentioned by Akbar in Slamet.[11]

At the development stage, ADDIE is the implementation of *pilot-tests* or also known as small group experiments. In this study, *the pilot-test* was applied using *one to one* where there were 9 users. Theresults of analysis and processing of user responses were obtained as an overall percentage, which is 90%. It can be concluded that the Reading Lens *flashcard* learning media is very feasible to be applied in early reading in grade 1 elementary school and requires a slight revision regarding the lack of learning media during the experiment.

The results of the validation test of media experts, it is known that all statements on the assessment instrument received a Aiken's V value of ≥ 0.60. This criterion is in accordance with the minimum validity requirements according to Aiken which states that an item is declared valid if it has a value of V ≥ 0.60. Likewise, the results of the validation test of material and language experts showed that each statement item on the instrument had an Aiken's V value ≥ 0.60. It can be concluded that the validation instruments of media experts, material validation, and language are declared to meet the set validity standards. This proves that *AR-based Reading Lens flashcard* media is declared valid and feasible for use in early reading learning.

At the implementation stage of the Reading Lens media, a response questionnaire was filled out by users, namely teachers and all 31 students. Data analysis obtained an average percentage of student response scores of 90%, while responses from classroom teachers reached 95%. Referring to the assessment criteria according to Akbar, the acquisition of the score puts the Reading Lens media in the category ***of very feasible*** or ***very practical*** to be implemented in early reading learning. This high score indicates that the media is not only easy to use, but also able to attract students' interest in learning significantly.

C. The Effectiveness of *AR-Based Reading Lens Flashcards*

The analysis of the data distribution was carried out through normality tests on *pretest* and *posttest* scores with the help of SPSS 27. This test aims to determine the type of statistics to be used in hypothesis testing. The basis for decision-making is that if the significance value (Sig.) is greater than 0.05, then the data is categorized as normally distributed. The recapitulation of the results of *the pretest* and *posttest normality* tests in small groups is presented in the following table 2:

[11] Fayrus Abadi Slamet, *Model Penelitian Pengembangan (R n D)*, Cetakan ke-1 (Malang: Institut Agama Islam Sunan Kalijogo Malang, 2022).

Table 1. Results of Pretest *and* Posttest *Data Normality Test* for Small Groups

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.234	8	.200*	.835	8	.066
Posttest	.280	8	.065	.802	8	.030

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Based on the results of the normality test using the Shapiro-Wilk method (considering the number of samples N=8), a significance value for the data was obtained *Pretest* by 0.066. Because the value of 0.066 > 0.05 can be concluded that the data *Pretest* Normal distribution. Meanwhile, in the data *Posttest*, the significance value obtained is 0.030 < 0.05 then statistically the data *Posttest* shows abnormal distribution. Because abnormal data was obtained, the next stage was to analyze and process data in the form of the wilcoxon signed rank test.

The assessment criteria for the Wilcoxon Signed Rank Test test is that if the significance value is 0.05, then the hypothesis is rejected. This test was chosen because the results of the normality test showed that the research sample data was abnormally distributed. The results of the small batch processing can be seen in Table 3:

Table 2. Small Group Wilcoxon Signed Test

Ranks				
		N	Mean Rank	Sum of Ranks
Posttest - Pretest	Negative Ranks	0a	.00	.00
	Positive Ranks	8b	4.50	36.00
	Ties	0c		
	Total	8		

a. *Post-test* < pre-test
b. *Posttest* > Pretest
c. *posttest* = pretest

Test Statistics

	Posttest - Pretest
Z	-2.640b
Asymp. Sig. (2-tailed)	.008

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on the Ranks table, the results of the comparison between *pretest* and *posttest* scores show that all test subjects (N=8) fall into the Positive Ranks category. This means that all respondents (8 people) experienced an increase in scores from *pretest* to *posttest* Based on the Test Statistics table, it is known that the value of Asymp. Sig. (2-tailed) is 0.008. Because the significance value is smaller than the significance level of 0.05 (0.008 < 0.05), it shows that there is a significant difference between *the pretest* and *posttest* results in small-scale trials. Thus, the development of the development stage product in the ADDIE model is statistically proven to be effective in significantly increasing respondent achievement

Then it was followed by the analysis of the normality test of *pretest* and *posttest* data in a large group of implementation stages using *SPSS 27.* The aim is to find out whether the pretest and *posttest data are normal or not* for 31 grade 1 students at SDN Leyangan. The following is a table of the results of the normality test processing:

Table 3 Results of Large Group Normality Test

Tests of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.213	31	.001	.844	31	.000
Posttest	.197	31	.004	.892	31	.004

a. Lilliefors Significance Correction

Given that the number of samples in this study is small (N=31), the interpretation of the results is focused on the significance values in the Shapiro-Wilk column because it has a higher sensitivity for a limited sample. The results of the Shapiro-Wilk normality test on 31 students showed a significance value of 0.000 for the pretest and 0.004 for *the posttest*. Given the P value <

0.05, the data is declared not to be normally distributed. As a consequence, hypothesis testing was performed using the Wilcoxon Signed Rank Test non-parametric statistical test.

To measure the impact of the use of Reading Lens media on students' reading skills, statistical analysis was carried out through the Wilcoxon Signed Rank Test because the distribution of data was abnormal. The results of the statistical calculation show that the comparison of the significance value to the real level of 0.05 can be seen in table 5 as follows:

Table 4 Large Group Wilcoxon Signed Test

Ranks

		N	Mean Rank	Sum of Ranks
Posttest - Pretest	Negative Ranks	0a	.00	.00
	Positive Ranks	30b	15.50	465.00
	Ties	1c		
	Total	31		

a. *Post-test* < pre-test
b. *Posttest* > Pretest
c. *posttest* = pretest

Test Statistics

	Posttest - Pretest
Z	-4.847b
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on the results of the Wilcoxon Signed-Rank Test, there were 30 students who experienced an increase in scores from pretest to *posttest*, while 1 other student had a fixed score. Statistically, a significance value of 0.000 < 0.05 was obtained, indicating a significant difference between the results before and after treatment. Thus, it can be concluded that the use of learning media has proven to be effective in significantly improving student learning outcomes.

In order to find out the level of effectiveness of the use of Reading Lens media in more depth, a follow-up analysis was carried out using the Normalized Gain (N-Gain) test. This analysis aims to measure the difference between the pretest and *posttest scores* that are converted into the score acquisition scale. The effectiveness criteria refer to the Hake (1999) classification as follows:

Table 5. N-Gain criteria according to Hake

N-Gain Value	Categories
≥ 0.70	Height
0,30 – 0,69	Medium
< 0.30	Low

The results of the N-Gain calculation on students' initial reading ability were stated that the student score was between 0.30 to 0.70. According to the classification of Hake (1998) it is included in the medium category. These results show that the use of Reading Lens media is significantly effective in improving students' initial reading learning outcomes. Despite being at a medium level of effectiveness, this improvement proves that the integration of Augmented Reality technology is able to facilitate students' understanding of early literacy better than previous conventional methods.

The development of Reading Lens learning media is a form of realizing the concept of concrete media by not leaving technology in it. Reading Lens is a media in the form of an interactive flashcard in the form of a *Stuart T* with 3D animation and audio feedback. This research is in line with the research conducted by Novianti and Pratiwi which states that the use of *AR* can stimulate students' initial reading ability due to the implementation of *AR* in the form of writing, audio, and animation.[12]

In research conducted by Amal and Sugiarti, it was stated that *AR* in this advanced era has a strong influence on the development of students' literacy.[13] This was also confirmed by Riyantoro and Makmur that basically *AR* is effectively used in learning at school and independently, but to use it requires socialization related to *AR* so that understanding of *AR* can be done thoroughly.

Fundamentally, technology has indeed eaten all aspects of life, including education. *AR* is an effective form that can be applied in the world of education, especially as a media. Increasing understanding and human resources towards digitalization can be said to be important, especially for educators who distribute their knowledge and knowledge to students.

Moving from effectiveness *AR* In learning, especially students' reading ability, this study also uses the word method as the most efficient and effective means of learning for beginning reading. Strengthened by the data obtained by Adinda and Nurulaini, it was stated that the word

[12] Rahmah Novianti and Niken Pratiwi, "Augmented Reality (AR) Media to Stimulate Early Reading Skills in Early Childhood," *JIV-Jurnal Ilmiah Visi* 19, no. 2 (2024), https://doi.org/10.21009/JIV.1902.10.

[13] Azizah Amal, Rusmayadi, and Tri Sugiarti, "The Effectiveness of Augmented Reality-Based Learning Media in Improving Vocabulary Mastery of Early Childhood in Makassar City," *Jurnal Pendidikan Anak Usia Dini Undiksha* 13, no. 1 (2025), https://doi.org/10.23887/paud.v13i1.86193.

method made students not only know words but also learned how to arrange words.[14] In another study by Oktavia, Djuanda, and Iswara, it was stated that the word method is an early milestone in student development in reading skills.[15]

The research by Maria explained about pouring the word method into the form of an effective card for students to read fluently.[16] Inline with research conducted by Susantini and Kristiantari, the attractive display of *flashcards* contains children to be motivated to learn and the repetition mode on *the flashcards* fosters students' memory of the material they are learning.[17] The integration of the word method is implemented in the form of *a flashcard* that is suitable to be applied to students with operational-concrete characteristics, namely in grades 1 and 2.

From several previous studies, no learning media has been found that utilizes the three effective media, namely *flashcards, AR,* and word methods in one media unit. The existence of this research is an innovation of the three media created in the form of Reading Lenses. This research is present based on existing data from the results of interviews and observations of the needs of 1st grade students of SDN Leyangan in beginning reading.

Based on the data from the validity and feasibility tests, the Reading Lens media succeeded in showing the practicality and feasibility of early reading learning media in grade 1 of SDN Leyangan. This was obtained from the analysis of validation tests by experts and also small-scale response questionnaires, large-scale responses, and 1st grade homeroom teachers of SDN Leyangan.

Next, the *results of the pretest* and *posttest*, which were tested on students, obtained effective and significant results from the normality test, the wilcoxon signed rank test, and finally the N-gain test. The reading ability of students who have received treatment is gradually leveled up. It is also found that students who originally did not know at all about syllables and letter decomposition became aware of the form of writing and decapitating syllables and letters correctly.

Overall, the results of a series of validity, feasibility, and effectiveness analyses show that learning media *Flashcard* Reading Lens based *Augmented Reality (AR)* make a positive contribution to the early reading learning of grade 1 students. This media meets the technical and

[14] Arifin Ahmad et al., "Pengaruh Metode Kata Lembaga Terhadap Kemampuan Membaca Permulaan Siswa Kelas II Sekolah Dasar," *Cendikia: Jurnal Pendidikan Dan Pengajaran* 2, no. 2 (2024), https://doi.org/10.572349/cendikia.v2i2.918.

[15] Delia Oktavia, Dadan Djuanda, and Prana Dwija Iswara, "Pengembangan E-Flashcard Berbasis Metode Kata Lembaga Sebagai Media Pembelajaran Membaca Permulaan Siswa Sekolah Dasar," *Jurnal Onoma: Pendidikan, Bahasa, Dan Sastra* 10, no. 3 (2024), https://doi.org/10.30605/onoma.v10i3.3941.

[16] Sonya Kristiani Maria, "Penggunaan Media Kartu Kata Untuk Meningkatkan Kemampuan Membaca Pada Siswa Kelas 2 Sekolah Dasar," *Edudikara: Jurnal Pendidikan Dan Pembelajaran* 5, no. 1 (2020), https://doi.org/10.32585/edudikara.v5i1.178.

[17] Ni Luh Putu Susantini and Maria Goreti Rini Kristiantari, "Media Flashcard Berbasis Multimedia Interaktif Untuk Pengenalan Kosakata Bahasa Inggris Pada Anak Usia Dini," *Jurnal Pendidikan Anak Usia Dini Undiksha* 9, no. 3 (2021), https://doi.org/10.23887/paud.v9i3.37606.

pedagogical feasibility aspects, obtains positive responses from users, and is proven to be able to improve student learning outcomes through an interactive visual approach. These findings are in line with the goal of media development, which is to provide an interesting learning alternative, easy to operate, and in accordance with the characteristics of students in the concrete operational phase. Thus, the results of this analysis reinforce that the integration of technology *AR* The word method can be an innovative solution in supporting the mastery of basic literacy in elementary schools.

CONCLUSION

This research has succeeded in developing an Augmented Reality (AR)-based "Reading Lens" learning media through the ADDIE development model that integrates 3D visual technology into a physical card with a three-level difficulty tiering system. Based on the results of the validation test using the Aiken's V formula, this media was declared very valid by material and language experts. The superiority in terms of practicality is also proven through the very positive response from teachers and students with a percentage of 90-95%, which puts this media in the category of very feasible to be implemented. Statistically, the Reading Lens media has proven to be effective in improving the initial reading ability of 1st grade students of SDN Leyangan, which is shown by the significance of the Wilcoxon test (0.000) and the acquisition of an N-Gain score of 0.65 which is in the medium category. These findings confirm that the use of AR-based interactive media is able to provide better cognitive stimulus than conventional methods. As a recommendation, this media can be an alternative solution for teachers in strengthening basic literacy, and the next researcher is expected to expand the scope of vocabulary and test its effectiveness on a wider sample scale.

BIBLIOGRAPHY

Agatha Kristi Pramudika Sari, and Shinta Shintiana. “Analisis Kemampuan Membaca Permulaan Dan Kesulitan Yang Dihadapi Siswa Kelas 1 Sekolah Dasar.” *Jurnal Lensa Pendas* 8, no. 2 (2023). https://doi.org/10.33222/jlp.v8i2.2818.

Ahmad, Arifin, Fina Oktaviana, Meraldy, Ramadhina Adinda, and Sekar Nurulaini. “Pengaruh Metode Kata Lembaga Terhadap Kemampuan Membaca Permulaan Siswa Kelas II Sekolah Dasar.” *Cendikia: Jurnal Pendidikan Dan Pengajaran* 2, no. 2 (2024). https://doi.org/10.572349/cendikia.v2i2.918.

Amal, Azizah, Rusmayadi, and Tri Sugiarti. “The Effectiveness of Augmented Reality-Based Learning Media in Improving Vocabulary Mastery of Early Childhood in Makassar City.” *Jurnal Pendidikan Anak Usia Dini Undiksha* 13, no. 1 (2025). https://doi.org/10.23887/paud.v13i1.86193.

Aprilia, ulfiatul inka, Fathurohman, and Purbasari. “Analisis Kesulitan Membaca Permulaan Siswa Kelas I.” *Penelitian Dan Pengembangan Pendidikan* 5, no. 2 (2021).

Cahyani, Aulia Dwi, Ninik Suryani, and Lilis Nurlaela. "Pengembangan Media Pembelajaran Augmented Reality Sebagai Inovasi Pendidikan." *Jurnal Inovasi Teknologi Pendidikan* 10, no. 2 (2023).

Cahyanti, Nadila Resti, Nanda William, and Wahyu Nurmalasari. "Pengembangan Media Pembelajaran E-Flashcard Untuk Meningkatkan Keterampilan Membaca Permulaan Peserta Didik Kelas 1 Sekolah Dasar." *Jurnal Elementaria Edukasia* 6, no. 4 (2023). https://doi.org/10.31949/jee.v6i4.6160.

Elvina, Tri, Dian Miranda, and Lukmanulhakim Lukmanulhakim. "Pengembangan Flashcard Tematik Berbasis Augmented Reality Anak Usia 5-6 Tahun." *Jurnal Edukasi* 2, no. 1 (2024). https://doi.org/10.60132/edu.v2i1.256.

Huduni, Awanisul, Lalu Hamdian Affandi, and Khairun Nisa. "Analisis Kesulitan Siswa Dalam Membaca Permulaan Di Kelas 1 SD Negeri 3 Darek." *Jurnal Ilmiah Profesi Pendidikan* 7, no. 2 (2022). https://doi.org/10.29303/jipp.v7i2.488.

Maria, Sonya Kristiani. "Penggunaan Media Kartu Kata Untuk Meningkatkan Kemampuan Membaca Pada Siswa Kelas 2 Sekolah Dasar." *Edudikara: Jurnal Pendidikan Dan Pembelajaran* 5, no. 1 (2020). https://doi.org/10.32585/edudikara.v5i1.178.

Meo, Alwisia, Maria Patrisia Wau, and Yosefina Uge Lawe. "Analisis Kesulitan Belajar Membaca Permulaan Pada Siswa Kelas I SDI Bobawa Kecamatan Golewa Selatan Kabupaten Ngada." *Jurnal Citra Pendidikan* 1, no. 2 (2021). https://doi.org/10.38048/jcp.v1i2.247.

Novianti, Rahmah, and Niken Pratiwi. "Augmented Reality (AR) Media to Stimulate Early Reading Skills in Early Childhood." *JIV-Jurnal Ilmiah Visi* 19, no. 2 (2024). https://doi.org/10.21009/JIV.1902.10.

Oktavia, Delia, Dadan Djuanda, and Prana Dwija Iswara. "Pengembangan E-Flashcard Berbasis Metode Kata Lembaga Sebagai Media Pembelajaran Membaca Permulaan Siswa Sekolah Dasar." *Jurnal Onoma: Pendidikan, Bahasa, Dan Sastra* 10, no. 3 (2024). https://doi.org/10.30605/onoma.v10i3.3941.

Slamet, Fayrus Abadi. *Model Penelitian Pengembangan (R n D)*. Cetakan ke-1. Malang: Institut Agama Islam Sunan Kalijogo Malang, 2022.

Sugiyono. *Metode Penelitian Kualitatif, Kuantitatif, Dan R&D*. Bandung: Alfabeta, 2019.

Sureni Sureni, and Ibnu Muthi. "Peningkatan Kemampuan Membaca Siswa Kelas I SD Melalui Suku Kata Pada Mata Pelajaran Bahasa Indonesia." *Katalis Pendidikan : Jurnal Ilmu Pendidikan Dan Matematika* 2, no. 3 (2025). https://doi.org/10.62383/katalis.v2i3.2148.

Susantini, Ni Luh Putu, and Maria Goreti Rini Kristiantari. "Media Flashcard Berbasis Multimedia Interaktif Untuk Pengenalan Kosakata Bahasa Inggris Pada Anak Usia Dini." *Jurnal Pendidikan Anak Usia Dini Undiksha* 9, no. 3 (2021). https://doi.org/10.23887/paud.v9i3.37606.

Zulfah, Nadhirotuz. "Pemanfaatan Media Game Edukasi Wordwall Untuk Meningkatkan Minat Belajar Siswa." *Pubmedia Jurnal Penelitian Tindakan Kelas Indonesia* 1, no. 1 (2023). https://doi.org/10.47134/ptk.v1i1.5.