BUKTI KORESPONDENSI

SYIBLI MAUFUR

TITLE: AR Media Development to Improve Cultural Literacy and Language Skills in Elementary Schools

EDUKASIA Jurnal Pendidikan dan Pembelajaran

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Submission Acknowledgement

1 pesan

Mukhibat Syaufa <edukasiajurnal@gmail.com> 28 Agustus 2025 pukul 16.23
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

syiblimaufur:

Thank you for submitting the manuscript, "Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Language Skills in Madrasah Ibtidaiyah (MI) Cirebon City" to EDUKASIA Jurnal Pendidikan dan Pembelajaran. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

Submission URL: https://jurnaledukasia.org/index.php/edukasia/authorDashboard/submission/1686
Username: syiblimaufur

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

_____
EDUKASIA Jurnal Pendidikan dan Pembelajaran

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Pemberitahuan Lanjut Proses Artikel

Editor Edukasia <edukasiajurnal@gmail.com> 28 Agustus 2025 pukul 16.31
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

syiblimaufur:

SELAMAT!!!. Kami beritahukan bahwa artikel yang telah disubmit di EDUKASIA Jurnal Pendidikan dan Pembelajaran, dengan judul "Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Language Skills in Madrasah Ibtidaiyah (MI) Cirebon City". telah lolos seleksi editor dan akan dilanjutkan prosesnya. Namun sebelumnya penulis harus menyetujuinya dengan membayar APC sesuai informasi pada halaman berikut http://jurnaledukasia.org/index.php/edukasia/fees. APC dikirim ke nomor rekening Seabank 901650658882 atas nama Khoirul Fathoni.. Selanjutnya, agar melakukan konfirmasi melalui nomor https://wa.me/6282139055156. Batas konfirmasi pembayaran tanggal 31 Agustus 2025. Jika saudara sudah melunasi pembayaran, maka artikel saudara akan masuk tahap review, revisi, dan seterusnya hingga diterbitkan. Proses ini memakan waktu sekitar 2-3 bulan. Jika tidak ada respon sampai batas waktu yang ditentukan maka dianggap tidak menyetujui prosesnya dilanjutkan, dan artikel saudara akan di Decline dari OJS Edukasia.

Terimakasih

_____
EDUKASIA Jurnal Pendidikan dan Pembelajaran

—
Reply to this comment at #1686 syiblimaufur et al. or unsubscribe from emails sent by EDUKASIA Jurnal Pendidikan dan Pembelajaran.

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Editor Decision

1 pesan

Editor Edukasia <edukasiajurnal@gmail.com> 28 Agustus 2025 pukul 19.17
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

syiblimaufur, ade aspandi, abdus salam:

We have reached a decision regarding your submission to {$contextName}, "Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Language Skills in Madrasah Ibtidaiyah (MI) Cirebon City".

Our decision is to: Send to Review

Submission URL: https://jurnaledukasia.org/index.php/edukasia/authorDashboard/submission/1686

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Editor Decision

2 pesan

Editor Edukasia <edukasiajurnal@gmail.com> 10 September 2025 pukul 18.34
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

syiblimaufur, ade aspandi, abdus salam:

We have reached a decision regarding your submission to {$contextName}, "Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Language Skills in Madrasah Ibtidaiyah (MI) Cirebon City".

Our decision is: Revisions Required

edukasia-review-assignment-1686 Review.docx
229K

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id> 11 September 2025 pukul 19.22
Kepada: Editor Edukasia <edukasiajurnal@gmail.com>

Good evening, editor-in-chief and editors of the Edukasia journal. I am submitting the revised manuscript below. This revision meets the reviewer's request and has been completed with care and attention to detail. Thank you.
[Kutipan teks disembunyikan]

Revised Results-AR Media Development to Improve Cultural Literacy and Language Skills in Element.docx
83K

EDUKASIA: Jurnal Pendidikan dan Pembelajaran
Vol. 4, 2 (December, 2023), pp. 61-70
ISSN: 2721-1150 EISSN: 2721-1169

Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Language Skills in Madrasah Ibtidaiyah (MI) Cirebon City

Commented [R1]: Ganti dengan kata pengembangan

Commented [R2]: Ini hapus

Pengembanagan Media AR untuk Meningkatkan Literasi Budaya dan Kemampuan Bahasa di Madrasah Ibtidaiyah

Syibli Maufur[1], Ade Aspandi[2] , Abdus Salam[3]
[1] Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@uinssci.ac.id
[2] Universitas Islam Al-Ihya Kuningan, Indonesia ; adeaspandi@unisa.ac.id
[3] Universitas Islam Bunga Bangsa Cirebon, Indonesia ; abdussalamdz@gmail.com

DOI:		
Received: April 2020	Accepted: June 2020	Published: September 2020

ARTICLE INFO

Keywords:

Educational Technology Management
AR-Based Learning Media
Cultural Literacy
Language Skills

Article history:

Received 2021-08-14
Revised 2021-11-12
Accepted 2022-01-17

ABSTRACT

This study aims to optimize educational technology management through the development of Augmented Reality (AR)-based learning media on cultural diversity materials to enhance both cultural literacy and language skills among Madrasah Ibtidaiyah (MI) students in Cirebon City. The research employed the Research and Development (R&D) method with the 4D model (Define, Design, Development, Dissemination). Data were collected through language proficiency tests, literacy assessments, observations, questionnaires, and interviews. Quantitative data were analyzed using statistical tests, while qualitative data were examined descriptively. The findings indicate that AR-based learning media are feasible and effective in improving students' cultural literacy and language skills. Statistical tests revealed a significant difference in students' performance before and after the implementation of AR media (sig = 0.00 < 0.05). Furthermore, the use of AR media fostered students' ability to comprehend and express cultural content through language more effectively. This study concludes that optimizing technology management through AR-based learning media provides an innovative pedagogical solution to strengthen cultural literacy and language skills among MI students in Cirebon City.

Commented [R3]: Penelitian RND seharusnya mengembangkan bukan mengoptimalkan

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Syibli Maufur
Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@syekhnurjati.ac.id

1. INTRODUCTION

The background of this research is the low level of cultural literacy and language skills among Indonesian students. From a global perspective, globalization has significantly impacted life, making the world feel smaller due to the ease of accessing information through technology. This phenomenon has increased life complexities, requiring education to produce graduates with not only life skills but also strong cultural literacy and adequate language proficiency to understand and communicate Indonesia's national identity.

Cultural literacy and language skills are two essential aspects of education that are interrelated. Cultural literacy refers to the understanding and appreciation of diverse cultural values, traditions, and practices. Ibda (2017) emphasizes the urgency of maintaining the mother tongue in elementary schools as part of cultural literacy to preserve cultural identity and local heritage. Language skills, on the other hand, encompass students' ability to comprehend, express, and construct knowledge through speaking, reading, listening, and writing. According to Nation (2013), strengthening language skills at the elementary level is crucial because it forms the foundation for students' academic achievement and their capacity to engage in broader cultural contexts. Integrating cultural literacy into learning media can therefore enhance students' ability to communicate cultural knowledge effectively and meaningfully.

Cultural literacy can be developed in schools through learning activities, one of which is utilizing learning media. Learning media are tools used to deliver lesson materials to facilitate students' understanding. Proper media usage can increase students' engagement, comprehension, and communication outcomes. Budiarti and Haryanto (2020) developed comic-based media to enhance students' reading comprehension and showed positive learning results. Additionally, using interactive multimedia in distance learning has proven effective in helping students improve not only their conceptual understanding but also their ability to articulate knowledge through language (Uno, 2021). The selection and development of learning media should consider students' linguistic abilities and learning objectives to achieve optimal outcomes.

Effective learning requires appropriate management. One essential management aspect in schools is educational technology management, which focuses on planning, developing, implementing, and evaluating technology in an educational context to enhance learning effectiveness. According to Budiningsih (2003), learning theories have evolved toward Vygotsky's sociocultural revolution, emphasizing the importance of social interaction in learning. In this context, managing educational technology becomes crucial to ensure that tools and media align with students' pedagogical, cultural, and linguistic needs. Hadiyanto (2004) stresses that the decentralization of education management in Indonesia requires appropriate strategies in technology implementation to suit local contexts and the specific needs of educational institutions.

The demand for improving literacy skills in Indonesia continues to grow, in line with the persistently low literacy and language proficiency levels of Indonesian students. This is evidenced by the Progress in International Reading Literacy Study (PIRLS) survey in 2011, which ranked Indonesian students among the bottom ten (TIMSS & PIRLS, 2012). Additionally, literacy and language assessments conducted by the Programme for International Student Assessment (PISA) showed similar results, indicating weak literacy and language performance among Indonesian students from 2000 to the most recent assessment in 2013 (OECD, 2003; OECD, 2004; OECD, 2007; OECD, 2010; OECD, 2013).

Given the above conditions, various efforts have been made to improve cultural literacy and language skills among Madrasah Ibtidaiyah (MI) students by implementing innovative learning models and the National Literacy Movement (GLN). However, applying innovative learning models and GLN programs alone is insufficient if they are not engaging. Attractive and innovative learning media, such as digital technology-based Augmented Reality (AR), are necessary to make learning more interactive and to help MI students develop both cultural

Commented [R4]: Perjelas dampak rendahnya literasi budaya terhadap pemahaman siswa tentang budaya mereka sendiri dan masyarakat global.

Menjelaskan bagaimana literasi budaya yang rendah menghambat kemampuan bahasa, yang pada gilirannya mempengaruhi kualitas komunikasi siswa dan integrasi sosial di MI Cirebon

Commented [R5]: Berikan penjelasan tentang contoh atau data spesifik yang menghubungkan globalisasi dengan tantangan di dunia pendidikan, khususnya dalam hal literasi budaya dan kemampuan bahasa.

understanding and language competence.

Regarding the explanation above, utilizing Augmented Reality in learning is essential as it makes learning more engaging, thereby enhancing students' cultural literacy and their ability to express cultural knowledge through language (Baran et al., 2020; Ibáñez et al., 2020; Xiao et al., 2020; Fan et al., 2020; Taskiran, 2019). Several studies on integrating educational technology have been conducted (Cutajar, 2019; Lee, 2019; Balakrishnan, 2014; Lackovic et al., 2017; Ng'ambi, 2013), recommending the use of technology in learning while considering pedagogies based on student-centered authentic learning (Casey et al., 2016). In line with this, digital technology utilization significantly impacts increasing students' communication, comprehension, and problem-solving abilities (Sobon & Mangundap, 2019; Ozan, 2013). Many researchers have demonstrated that AR positively impacts learning. Through AR, students can enhance their knowledge and language skills, such as reading comprehension and verbal expression, while interacting in real-world scenarios (Sirakaya & Cakmak, 2018; Buchner & Zumbach, 2018).

The objective of this study is to optimize educational technology management through the development of valid and usable AR-based learning media, explain the implementation patterns of AR-based learning media in cultural diversity materials in Madrasah Ibtidaiyah/elementary schools, and illustrate its impact on improving students' cultural literacy and language skills.

Commented [R6]: Tekankan tentang distingsi penelitian ini, dengan mengkaji 5 penelitian sebelumnya yang berkaitan dengan tema

Commented [R7]: Gunakan kata mengembangkan bukan mengoptimalisasikan karena ini adalah penelitian RND

Commented [R8]: Jelaskan bagaimana teknik analisis data dilakukan oleh penelitian

2. METHOD

This study is a type of Research and Development (R&D) research. According to Sugiyono (2015), research and development methods are used to produce specific products and test their effectiveness. Educational research and development aim to create new products through a systematic development process.

Research products in the field of education can include media, models, teaching aids, books, evaluation tools, learning devices, curricula, school policies, and more. Each product requires different research procedures. One research and development model developed by Thiagarajan (1974) is the 4D model (Define, Design, Development, and Dissemination).

This study employs the research and development (R&D) method. The product developed is an augmented reality-based learning media on Indonesian cultural diversity to enhance both cultural literacy and language skills among Madrasah Ibtidaiyah students. The development procedure for learning media in this study is illustrated in the following figure:

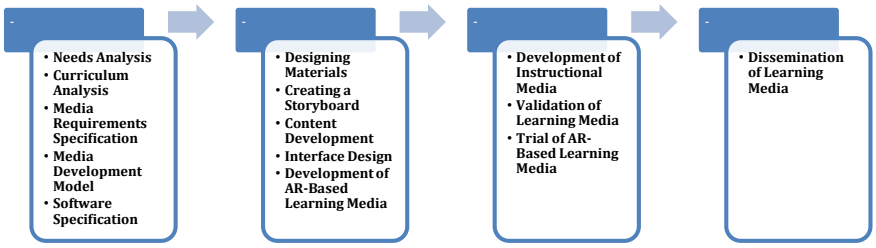

Figure 1. Learning Media Development Research Procedure

Regarding the above, data for this study were collected using (1) cultural literacy and language skills tests, (2) questionnaires, and (3) interviews. The literacy and language skills tests were designed to measure students' reading comprehension, vocabulary mastery, and ability to express ideas in written and oral forms. Questionnaires were distributed to capture students' responses and perceptions toward the AR-based media, while interviews were conducted with teachers to gain qualitative insights. Based on these data collection techniques, the research

produced both qualitative and quantitative data. Qualitative data were analyzed using inductive techniques, while quantitative data were analyzed using statistical tests with the assistance of SPSS version 22 for Windows.

3. FINDINGS AND DISCUSSION

A. Optimization of Educational Technology Management in MI Kota Cirebon

Based on the research, several key aspects were identified regarding the optimization of educational technology management in MI Kota Cirebon:

1. **Infrastructure, Technology Resources, and Integration in Learning**
   This study found that most MI in Kota Cirebon have basic technological infrastructure such as computers, projectors, and internet networks. However, limited device availability remains a challenge for schools that lack optimal budget support. Additionally, the absence of computer laboratories remains a significant barrier for MI in Kota Cirebon. Schools attempt to optimize technology implementation in learning by utilizing digital media such as interactive videos, Augmented Reality (AR) devices, and school Wi-Fi to help teachers develop instructional materials. However, the primary obstacle is the lack of training for teachers to adapt to this technology.
2. **Digital Competence of Educators and Students**
   The digital competence of educators varies, with approximately 60% of teachers feeling fairly confident in using educational technology. Training provided to teachers has helped improve their digital skills, but continuous professional development programs are still needed. On the other hand, students tend to be more adaptive to technology but require guidance to use it productively. Schools continue to utilize Teacher Working Groups (KKG) to enhance educators' digital competence. They also strive to create a supportive environment for teachers to share knowledge by facilitating those who have received training to mentor their colleagues.
3. **Effectiveness and Efficiency of Educational Management**
   Technology-based management systems such as e-administration and e-report cards have been implemented in several MI to improve operational efficiency. The use of online assessments has helped reduce manual administrative tasks. However, some schools still face challenges in digital infrastructure, making the implementation of these systems suboptimal in certain MI in Kota Cirebon.
4. **School Leadership Policies on Educational Technology Management**
   School principals play a crucial role in supporting the implementation and development of educational technology in MI Kota Cirebon. Policies include budget allocation for acquiring technological devices, organizing training for educators, and monitoring the effectiveness of technology usage in learning. Additionally, school leaders are responsible for ensuring that digital infrastructure functions optimally and aligns with the curriculum.

   Some schools have developed internal policies regulating technology use among students and teachers to enhance learning efficiency. However, periodic evaluations are necessary to adjust policies based on the latest technological developments and school needs. The support of school principals in establishing partnerships with external stakeholders, such as educational technology providers and training institutions, is also a critical factor in sustaining the optimization of technology in MI Kota Cirebon.

   Technology-based management systems such as e-administration and e-report cards have been implemented in several MI to enhance operational efficiency. The use of digital attendance systems and online evaluations has helped reduce manual administrative tasks. Nonetheless, some schools still face digital infrastructure challenges, causing suboptimal implementation of these systems across all MI in Kota Cirebon.

B. Development of AR-Based Learning Media in MI Kota Cirebon

Commented [R9]: HASIL;
Sesuaikan dengan Langkah-langkah Research and Development (R&D) dengan model 4D (Define, Design, Development, Dissemination). Bagaimana setiap tahap tersebut dilakukan oleh peneliti/pengembang media pembelajaran

PEMBAHASAN;

Jelaskan bagaiaman hasil dari validasi ahli, terutama yang berkaitan dengan kesesuaian desain AR dengan tujuan pembelajaran dan kesesuaian konten budaya dengan konteks lokal.

Diskusikan bagaimana hasil uji coba terhadap siswa menampilkan bahwa media AR tidak hanya layak, tetapi juga efektif dalam meningkatkan pemahaman mereka tentang materi. Tambahkan analisis mengapa hasil posttest menunjukkan peningkatan yang signifikan dalam literasi budaya dan keterampilan bahasa, dan faktor-faktor apa yang berkontribusi terhadap hasil ini.

Stage 1: Define

The research activity for developing learning media begins with the **define** stage. In this phase, activities include conducting a literature review and needs analysis to develop a product that aligns with the needs and characteristics of the learners.

Stage 2 *Design*

The second stage is product design. The developed product is an augmented reality-based learning media focused on cultural diversity materials in West Java.

Stage 3 *Development*

In this stage, the development process of Augmented Reality (AR)-based learning media focuses on cultural diversity materials. The development begins with designing the user flow, ensuring it is easy to understand and engaging for students. Users will first access the main menu in the AR application, serving as the gateway to various available learning features. This approach aims to create a more interactive learning experience and enhance students' understanding of the material.

The main menu of the application includes several key features: the **AR scan menu**, **quiz**, and **information**. The AR scan feature allows students to scan specific objects to access interactively presented learning materials, such as information on traditional arts, clothing, and regional cuisines. Additionally, the information menu provides usage guidelines and targeted learning outcomes, helping students understand the objectives and benefits of each activity within the application. Thus, this AR-based learning media not only enhances students' engagement in learning but also enriches their experience in exploring cultural diversity more deeply.

Expert Validation Results for Learning Media

Table 1. Expert Validation Results for Learning Materials

Assessment Aspects	**Percentage**	**Criteria**
Presentation/Visual	72%	Feasible
Quality	70 %	Feasible
Ease Of Use	75%	Feasible
Language	86%	Higly Feasible
Average Percentage	**75,7%**	
Feasibility Criteria		**Feasible**

From Table 1, it is evident that the expert validation results indicate that the AR-based learning media falls into the **feasible** category. The average percentage is **75%**. The highest-rated aspect of this media is the **language aspect**, while the lowest-rated aspect is the **media quality**.

Expert Validation Results for Learning Materials

Tabel 2. Validasi Ahli Materi

No	Assessment Criteria	Material Expert Assessment
1	Clarity of Learning Instructions	5
2	Clarity of Learning Outcomes	4
3	Clarity of Concept Map of the Material to Be Learned	4
4	Content Coherence	4
5	Scope of Material	3
6	Relevance of Content to Objectives	4

No	Assessment Criteria	Material Expert Assessment
7	Clarity and Appropriateness of Language Relevance Used	4
8	Content Attractiveness in Motivating Users	3
9	Clarity of Instructions for Answering Questions	4
10	Balance of Question Proportion	3
11	Level of Question Difficulty	3
12	Alignment of Questions with Learning Outcomes	4
	Jumlah	**45**

Based on the validation by material experts, a total score of **45** was obtained. Referring to the feasibility percentage formula, the feasibility score was **75%**. According to the feasibility criteria, this score falls into the **feasible** category. This means that the content within the learning media product is **suitable for use**.

C. Improvement of Cultural Literacy and Learning Motivation of MI Students in Kota Cirebon

Based on data analysis results, it was found that students' cultural literacy skills improved, and they also demonstrated high learning motivation when using AR-based learning media for cultural diversity materials. The detailed results of data processing and analysis can be seen in the following table.

Table 3. Students' Cultural Literacy Skills

		MI A		MI B	
		Pretes	Postes	Pretes	Postes
N	Valid	30	30	35	35
	Missing	7	7	2	2
Mean		69.0000	83.0000	68.0000	84.2857
Median		70.0000	85.0000	70.0000	90.0000
Mode		60.00	90.00	60.00[a]	90.00
Std. Deviation		9.22889	7.94377	9.00980	6.98137
Variance		85.172	63.103	81.176	48.739
Minimum		50.00	70.00	50.00	70.00
Maximum		80.00	90.00	80.00	90.00

From Table 3, it can be seen that the cultural literacy skills of students in MI A had a pretest score of **69**, while the posttest score was **83**. Meanwhile, in MI B, the pretest score was **68**, and the posttest score was **84.28**. These results indicate that the average cultural literacy skills of students improved after learning using AR-based learning media on cultural diversity materials.

To determine the impact of AR-based learning media on students' cultural literacy skills, a normality test was conducted to check whether the data followed a normal distribution. The statistical test results can be seen in the following table.

Tabel 4. Uji Normalitas

One-Sample Kolmogorov-Smirnov Test					
		MI A		MI B	
		Pretes	Postes	Pretes	Postes
N		30	30	35	35
Normal Parameters[a,b]	Mean	69.0000	83.0000	68.0000	84.2857
	Std. Deviation	9.22889	7.94377	9.00980	6.98137
Most Extreme Differences	Absolute	.235	.311	.213	.336
	Positive	.235	.189	.213	.207
	Negative	-.217	-.311	-.188	-.336
Test Statistic		.235	.311	.213	.336
Asymp. Sig. (2-tailed)		.000[c]	.000[c]	.000[c]	.000[c]

From Table 4, it is evident that the data does not follow a normal distribution. This is indicated by the **sig value < 0.05**, which, based on decision-making criteria, means that the data is not normally distributed. Therefore, further analysis was conducted using a **paired sample test** to compare the means of two related groups. To determine whether there is a significant difference, a **paired sample test** was performed to analyze the differences in cultural literacy skills before and after using AR-based learning media. The results of this test can be seen in the following table.

Tabel 5. Uji Paired Sample Test

		N	Mean Rank	Sum of Ranks
MI_A_Postes - Pretes	Negative Ranks	0[a]	.00	.00
	Positive Ranks	28[b]	14.50	406.00
	Ties	2[c]		
	Total	30		
Z			-4.755[b]	
Asymp. Sig. (2-tailed)			.000	
MI_B_Postes - Pretes	Negative Ranks	0[d]	.00	.00
	Positive Ranks	32[e]	16.50	528.00
	Ties	3[f]		
	Total	35		
Z			-5.070[b]	
Asymp. Sig. (2-tailed)			.000	

From Table 5 above, it is shown that there is a **significant difference** in students' cultural literacy skills before and after learning using AR-based learning media on cultural diversity materials. This is indicated by the **significance value (sig) < 0.05**, meaning that, based on decision-making criteria, there is a **significant difference** in students' cultural literacy skills **before and after** being taught with AR-based learning media.

From Table 6 above, the descriptive test results for students' learning motivation show that the **average score** for MI A is **80.83**, while for MI B, it is **80.73**. Based on these criteria, it can be concluded that students' **learning motivation falls into the high category**. This means that learning cultural diversity materials using AR-based learning media can effectively **enhance students' learning motivation**.

Tabel 6. Motivasi Belajar

		MI A	MI B
N	Valid	30	35
	Missing	5	0
Mean		80.8310	80.7314
Median		80.0000	80.0000
Mode		80.00	80.00
Std. Deviation		1.79073	2.14705
Variance		3.207	4.610
Minimum		78.33	78.30
Maximum		85.00	89.00

Based on the experimental trial of using AR-based learning media for cultural diversity materials in fourth-grade MI students, it was found that students' cultural literacy and learning motivation showed positive development. This is evident from the increase in cultural literacy and student motivation during the learning process. The use of AR media offers advantages, as it helps students learn about culture in a new way.

Currently, Augmented Reality (AR) has been one of the trending educational technologies since 2010. The Horizon Report (Johnson et al., 2010) assumes that AR has a positive impact on learning, creativity, and education. Many researchers have demonstrated that AR positively affects learning. Through AR, students can enhance their knowledge and skills, such as problem-solving, while engaging in real-world scenarios (Sirakaya & Cakmak, 2018; Buchner & Zumbach, 2018). Additionally, using AR can boost students' learning motivation and attitudes (Baran et al., 2020; Fan et al., 2020; Ibáñez et al., 2020; Taskiran, 2019; Xiao et al., 2020; Cai et al., 2020; Altinpulluk, 2018; Mundy et al., 2019).

Furthermore, AR in learning can also improve students' reading comprehension skills (Danaei et al., 2020). Additionally, using AR in education can enhance students' imagination (Bicen & Bal, 2016), making it particularly suitable for history lessons, helping students engage more deeply with historical narratives. In line with this, AR not only impacts academic performance, motivation, and student attitudes but also helps develop students' critical thinking skills (Syawaludin et al., 2019; Maas & Hughes, 2020).

Efforts to develop learning with AR have been extensively explored through various research studies. Previous studies, such as Taskiran (2019), found that using augmented reality games in English language learning increased students' learning motivation. Other research has also confirmed that augmented reality positively influences academic achievement and learning motivation (Wahyu et al., 2020; Azi & Gündüz, 2020; Sáez-López et al., 2019; Fatimah et al., 2019; David, 2017; Ismaeel & Al Mulhim, 2019; Sahin & Ozcan, 2019; Sural, 2018).

D. Improvement of Cultural Literacy and Language Skills of MI Students

The experimental trial of AR-based learning media not only demonstrated improvement in cultural literacy but also revealed significant progress in students' language skills. The integration of visual, textual, and interactive cultural materials through AR provided students with authentic learning contexts, which encouraged them to read, comprehend, and retell cultural stories in their own words. These multimodal experiences enriched their vocabulary and enhanced their reading comprehension, particularly in recognizing cultural terminology embedded in the lessons.

The measurement of language skills was carried out using pretest and posttest

assessments that evaluated reading comprehension, vocabulary mastery, and the ability to retell cultural content both orally and in written form. Students were given short passages related to cultural practices and asked to answer comprehension questions as well as express the meaning of the passages in their own language. The findings revealed notable improvement after the use of AR media, with students showing more accurate answers, longer written responses, and clearer oral explanations.

The statistical results presented in Table 7 below indicate that students' language skills increased significantly. In MI A, the mean score increased from 67.50 in the pretest to 81.20 in the posttest, while in MI B, the score increased from 66.85 to 82.10. These results suggest that AR-based media not only facilitated cultural literacy but also strengthened students' ability to process and express cultural knowledge through language.

Table 7. Students' Language Skills (Pretest–Posttest Results)

School	Test Type	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	67.50	68.00	65.00	8.200	50	80
	Posttest	30	81.20	82.00	85.00	7.950	65	90
MI B	Pretest	35	66.85	67.00	65.00	9.100	50	80
	Posttest	35	82.10	83.00	85.00	7.800	65	90

Table 7 illustrates the improvement in language skills among MI students after the implementation of AR-based learning media. In MI A, the mean score increased by 13.70 points from 67.50 to 81.20, while in MI B, the increase was 15.25 points from 66.85 to 82.10. The rise in both schools demonstrates that AR media contributed to enhancing students' reading comprehension, vocabulary mastery, and expression abilities. The median and mode values also shifted upward, indicating a consistent pattern of improvement across the student cohort. The minimum and maximum scores suggest that even the lowest-performing students showed progress, and the highest achievers reached close to the maximum benchmark. The standard deviation values, which slightly decreased in the posttest, imply that students' performance became more homogeneous after the intervention. These results collectively confirm that the use of AR-based cultural learning media positively impacted not only cultural literacy but also students' language development, enabling them to better articulate cultural knowledge in meaningful ways.

E. Improvement of Cultural Literacy of MI Students

The implementation of AR-based learning media also demonstrated a significant contribution to the improvement of cultural literacy among MI students. Cultural literacy, which refers to students' ability to recognize, understand, and appreciate cultural symbols, traditions, and values, became more visible as learners interacted with AR features that displayed cultural artifacts, local clothing, food, and performing arts. Through this interactive approach, students were not only exposed to factual information but also trained to connect cultural knowledge with their daily lives.

The learning process using AR encouraged students to develop a stronger sense of cultural identity. Activities such as scanning cultural objects and receiving interactive explanations enabled students to build associations between visual images and textual information. This multimodal exposure enriched their comprehension, allowing them to recall cultural elements more accurately and apply them in classroom discussions. Teachers observed that students became more active in expressing opinions about cultural diversity, and their enthusiasm during learning activities increased.

The quantitative findings of the study are presented in Table 8 below. The results show a marked increase in students' cultural literacy levels. In MI A, the mean score improved from

69.00 in the pretest to 83.00 in the posttest, while in MI B, the mean score increased from 68.00 to 84.29. These improvements suggest that AR-based cultural learning media were effective in fostering deeper cultural understanding and appreciation among MI students.

Table 8. Students' Cultural Literacy Skills (Pretest–Posttest Results)

School	Test Type	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	69.00	70.00	70.00	9.230	50.00	80.00
	Posttest	30	83.00	85.00	90.00	7.940	70.00	90.00
MI B	Pretest	35	68.00	70.00	60.00	9.010	50.00	80.00
	Posttest	35	84.29	90.00	90.00	6.980	70.00	90.00

Table 8 clearly demonstrates that cultural literacy skills improved after the integration of AR-based learning media. The mean scores increased by 14.00 points in MI A and by 16.29 points in MI B, which indicates substantial progress in students' ability to comprehend cultural content. The median and mode values also shifted upward, showing that the overall distribution of scores improved consistently across the student groups. Notably, the maximum scores reached 90.00 in both schools, suggesting that many students achieved a high level of cultural understanding. The minimum scores also improved, reflecting that weaker students benefited from the intervention as well. The reduction in standard deviation values indicates that students' performance became more uniform after using AR, suggesting equitable learning outcomes across the class. These findings highlight the effectiveness of AR-based media in enhancing cultural literacy by providing immersive, engaging, and contextually relevant learning experiences. The results confirm that digital media, when integrated into culturally rich content, can strengthen students' awareness of diversity and support the preservation of cultural identity.

F. Optimization of Educational Technology Management in MI Kota Cirebon

The success of implementing AR-based learning media in MI Kota Cirebon cannot be separated from the management of educational technology in schools. Educational technology management plays a vital role in ensuring that infrastructure, teacher competence, and leadership policies are aligned with pedagogical goals. The study revealed that most MI schools in Cirebon have begun integrating digital resources such as computers, projectors, and internet networks into their teaching practices, even though the availability of these facilities still varies. The integration of technology into learning was observed to be more effective when supported by clear planning and adequate resource allocation.

Another key aspect of educational technology management is the competence of teachers and students in using digital tools. Training and workshops provided to teachers significantly improved their ability to operate AR applications and design learning scenarios that integrate cultural and linguistic elements. Students, on the other hand, adapted quickly to AR-based interactions, though they still required guidance to use the media productively. Teacher collaboration through Teacher Working Groups (KKG) was also found to be effective in sustaining competence and sharing best practices in utilizing digital media.

School leadership and policy support were identified as decisive factors in sustaining the optimization of technology in education. Principals who allocated budgets for digital devices, organized teacher training, and monitored the effectiveness of technology-based learning were more successful in embedding AR media into their schools' instructional culture. Furthermore, schools that established partnerships with local stakeholders, such as universities and educational technology providers, demonstrated higher levels of sustainability in their technology programs. These management strategies created an ecosystem that allowed AR-based media to be implemented more effectively and equitably across MI in Cirebon City.

Table 9. Educational Technology Management in MI Kota Cirebon

Aspect	Indicator	Status/Findings
Infrastructure & Resources	Computers, projectors, internet, AR devices	Available, but varied across MI
Teacher Competence	Digital skills, AR training, KKG activities	Improving, needs continuous PD
Student Adaptability	Use of AR media and digital interaction	Adaptive, but requires guidance
School Leadership & Policies	Budget, training, monitoring, partnerships	Strong support in some MI schools
Efficiency of Management	e-administration, e-report cards, online tests	Implemented, but unevenly applied

Table 9 summarizes the findings on educational technology management in MI Kota Cirebon. The results indicate that infrastructure and digital resources are available, although their distribution remains uneven, which creates disparities in implementation quality. Teacher competence has shown improvement, particularly after training programs and peer collaboration in KKG, yet continuous professional development is still required to sustain digital literacy. Students were generally adaptive to AR-based learning but needed structured guidance to ensure that technology was used for productive learning rather than distraction. Leadership and policy support from school principals played a central role in determining the success of AR media integration, especially in terms of budget allocation, training initiatives, and external partnerships. The adoption of e-administration and digital assessments contributed to operational efficiency, but uneven infrastructure limited their widespread effectiveness. The findings suggest that optimizing educational technology management requires not only adequate resources but also consistent policy enforcement, stakeholder collaboration, and a culture of innovation. Collectively, these factors provide a strong foundation for sustaining AR-based learning innovations and enhancing both cultural literacy and language skills among MI students.

4. CONCLUSION

The findings of this study confirm that AR-based learning media developed on cultural diversity materials are feasible for classroom use, as indicated by expert validation results. Experimental trials revealed that the media had a significant positive impact on improving both cultural literacy and language skills among MI students in Cirebon City. Statistical analysis showed that there was a significant difference in students' performance before and after the use of AR media (sig < 0.05), with notable improvements in reading comprehension, vocabulary mastery, and students' ability to articulate cultural knowledge in oral and written forms.

In addition, the optimization of educational technology management—covering infrastructure, teacher competence, and leadership policies—played a vital role in supporting the integration of AR media into learning practices. Schools with stronger managerial support, adequate resource allocation, and teacher training demonstrated more effective implementation of AR-based media. This emphasizes that sustainable technology integration requires not only innovative tools but also robust management strategies.

Overall, the study concludes that optimizing technology management through the use of AR media offers an innovative and effective pedagogical solution to strengthen cultural literacy and language skills in elementary-level education. However, the scan-based system of the application still presents practical challenges, which opens opportunities for further development to create more user-friendly and accessible AR learning tools in the future.

Commented [R10]: Tambahkan implikasi penelitian dan arah penelitian selanjutnya

REFERENCES

Commented [R11]: Ditambah, minimal 40 referensi 80% dari artikel jurnal

1. Journal

Altinpulluk, H. (2018). Determining the trends of using augment reality. *Education and Information Technologies, 24*(2), 1089–1114. https://doi.org/10.1007/s10639-018-9806-3

Azi, F. B., & Gündüz, Ş. (2020). Effects of Augmented Reality Applications on Academic Success and Course Attitudes in Social Studies. *Shanlax International Journal of Education, 8*(4), 27–32. https://doi.org/10.34293/education.v8i4.3300.

Balakrishnan, V. (2014). Using social networks to enhance teaching and learning experiences in higher learning institutions. *Innovations in Education and Teaching International, 51*(6), 595–606.

Baran, B., Yecan, E., Kaptan, B., & Paşayiğit, O. (2020). Using augmented reality to teach fifth grade students about electrical circuits. *Education and Information Technologies, 25*(2), 1371–1385. https://doi.org/10.1007/s10639-019-10001-9

Bicen, H., & Bal, E. (2016). Determination of student opinions in augmented reality. *World Journal on Educational Technology, 8*(3). https://doi.org/10.18844/wjet.v8i3.642

Cai, S., Liu, E., Shen, Y., Liu, C., Li, S., & Shen, Y. (2020). Probability learning in mathematics using augmented reality: impact on student's learning gains and attitudes. *Interactive Learning Environments, 28*(5), 560–573. https://doi.org/10.1080/10494820.2019.1696839

Casey, A., Goodyear, V. A., & Armour, K. M. (2016). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society, 22*(2), 288–304.

Cutajar, M. (2019). Teaching Using Digital Technologies: Transmission or Participation? *Education Science, 9*, 226. https://doi.org/10.3390/educsci9030226

Danaei, D., Jamali, H. R., Mansourian, Y., & Rastegarpour, H. (2020). Comparing reading comprehension between children reading augmented reality and print storybooks. *Computers and Education, 153*, 103900. https://doi.org/10.1016/j.compedu.2020.103900

Fan, M., Antle, A. N., & Warren, J. L. (2020). Augmented Reality for Early Language Learning: A Systematic Review of Augmented Reality Application Design, Instructional Strategies, and Evaluation Outcomes. *Journal of Educational Computing Research, 58*(6), 1059–1100. https://doi.org/10.1177/0735633120927489

Fatimah, S., Setiawan, W., Juniati, E., & Surur, A. S. (2019). Development of Smart Content Model-based Augmented Reality to Support Smart Learning. *Journal of Science Learning, 2*(2), 65. https://doi.org/10.17509/jsl.v2i2.16204

Sáez-López, J. M., Sevillano-García, M. L., & Pascual-Sevillano, M. Á. (2019). Application of the ubiquitous game with augmented reality in primary education. *Comunicar, 27*(61), 66–76. https://doi.org/10.3916/C61-2019-06

Sahin, N., & Ozcan, M. F. (2019). Effects of augmented reality in teaching old Turkish language mementoes on student achievement and motivation. *Contemporary Educational Technology, 10*(2), 198–213. https://doi.org/10.30935/cet.554501

Sirakaya, M., & Cakmak, E. K. (2018). The effect of augmented reality use on achievement, misconception and course engagement. *Contemporary Educational Technology, 9*(3), 297–314. https://doi.org/10.30935/cet.444119

Taskiran, A. (2019). The effect of augmented reality games on English as foreign language motivation. *E-Learning and Digital Media, 16*(2), 122–135. https://doi.org/10.1177/2042753018817541

Wahyu, Y., Suastra, I. W., Sadia, I. W., & Suarni, N. K. (2020). The effectiveness of mobile augmented reality assisted STEM-based learning on scientific literacy and students' achievement. *International Journal of Instruction, 13*(3), 343–356. https://doi.org/10.29333/iji.2020.13324a

Xiao, M., Feng, Z., Yang, X., Xu, T., & Guo, Q. (2020). Multimodal interaction design and application in augmented reality for chemical experiment. *Virtual Reality & Intelligent Hardware, 2*(4), 291–304. https://doi.org/10.1016/j.vrih.2020.07.005

2. Proceeding

Laal, M. (2011). Knowledge Management in Higher Education. *Procedia Computer Science*, *3*, 544–549.

Budiyanto, M. A. K., Waluyo, L., & Mokhtar, A. (2016). Implementasi Pendekatan Saintifik dalam Pembelajaran di Pendidikan Dasar di Malang. *Proceeding Biology Education Conference*, *13*(1), 48.

3. Book

Johnson, L., Levine, A., Smith, R., & Stone, S. (2010). Simple augmented reality. *The 2010 Horizon Report*, 21-24. Austin, TX: The New Media Consortium.

NASKAH HASIL REVISI 1

AR Media Development to Improve Cultural Literacy and Language Skills in Elementary Madrasahs

Syibli Maufur[1], Abdus Salam [2], Ade Aspandi [3]
[1] Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@uinssci.ac.id
[2] Universitas Islam Bunga Bangsa Cirebon, Indonesia ; abdussalamdz@gmail.com
[3] Universitas Islam Al-Ihya Kuningan, Indonesia ; adeaspandi@unisa.ac.id

DOI:		
Received: April 2020	Accepted: June 2020	Published: September 2020

ARTICLE INFO

Keywords:

Educational Technology Management
AR-Based Learning Media
Cultural Literacy
Language Skills

Article history:

Received 2021-08-14
Revised 2021-11-12
Accepted 2022-01-17

ABSTRACT

This study aims to develop Augmented Reality (AR)-based learning media on cultural diversity materials as an effort to improve cultural literacy and language skills among Madrasah Ibtidaiyah (MI) students in Cirebon City. The research applied the Research and Development (R&D) method with the 4D model (Define, Design, Development, Dissemination). Data collection was conducted through language proficiency tests, literacy assessments, observations, questionnaires, and interviews. Quantitative data were analyzed using statistical tests, while qualitative data were described narratively. The results show that AR-based learning media are valid, practical, and effective in supporting the learning process. Statistical analysis confirmed a significant difference in students' performance before and after the use of AR media (sig = 0.00 < 0.05). Moreover, the integration of AR media enhanced students' ability to understand and express cultural content through language in a more meaningful way. This research concludes that the development of AR-based learning media provides an innovative educational product that contributes to strengthening cultural literacy and language skills among MI students in Cirebon City.

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Syibli Maufur
Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@syekhnurjati.ac.id

1. INTRODUCTION

The background of this research is the low level of cultural literacy and language skills among Indonesian students. Limited cultural literacy not only

hinders students' ability to understand and appreciate their own cultural heritage but also weakens their awareness of diversity in the global community. In Madrasah Ibtidaiyah (MI), such deficiencies are evident in students' limited vocabulary related to cultural expressions, lack of confidence in retelling cultural narratives, and difficulties in engaging with multicultural learning contexts. These conditions directly impact their communication skills, as language development is inseparable from cultural comprehension. When cultural literacy is weak, students struggle to express ideas meaningfully, resulting in reduced social integration and weaker participation in the broader educational environment.

Globalization further amplifies these challenges by rapidly transforming the way knowledge and information circulate across societies. The ease of accessing global content through digital media, while beneficial, often exposes students to dominant external cultures at the expense of local traditions. For instance, the 2018 PISA report highlighted that Indonesian students consistently rank below the OECD average in reading and cultural comprehension, reflecting not only language difficulties but also challenges in relating learning materials to cultural contexts (OECD, 2019). Similarly, the Ministry of Education and Culture (Kemendikbud, 2020) reported that many elementary students in urban areas are more familiar with global popular culture than with their own local heritage. This situation demonstrates how globalization reshapes learning priorities and calls for innovative educational responses that integrate cultural identity with global literacy demands.

Efforts to address these issues require educational media that do more than transmit knowledge; they must engage students in interactive, context-rich learning. Learning media play a strategic role in bridging cultural knowledge and language practice. Research by Budiarti and Haryanto (2020) showed that comic-based media improved reading comprehension, while Uno (2021) confirmed the effectiveness of interactive multimedia in enhancing linguistic expression. However, such approaches are still limited in immersing students within authentic cultural experiences. Augmented Reality (AR), with its capacity to combine real-world and digital interaction, offers opportunities to situate students within their cultural context while simultaneously strengthening their linguistic skills.

Recent studies support the integration of AR in education. Taskiran (2019) found that AR games increased student motivation in English language learning. Sirakaya and Cakmak (2018) demonstrated that AR improved students' reading comprehension and conceptual understanding. More recently, Fan et al. (2020) emphasized AR's role in enhancing early language acquisition, while Ibáñez et al. (2020) confirmed its effectiveness in deepening cultural knowledge in diverse learning environments. Furthermore, Xiao et al. (2020) revealed that multimodal AR interactions improved students' ability to link abstract concepts with practical applications. Despite these contributions,

few studies specifically address the dual challenge of enhancing both cultural literacy and language skills in the context of Indonesian primary education. This research seeks to fill that gap by focusing on Madrasah Ibtidaiyah in Cirebon City.

Accordingly, the objective of this study is to develop valid and usable AR-based learning media on cultural diversity materials, describe the patterns of its implementation in Madrasah Ibtidaiyah, and evaluate its effectiveness in enhancing students' cultural literacy and language skills. By doing so, this research contributes not only to the development of innovative learning media but also to the discourse on how technology can preserve cultural identity while strengthening language competence in the era of globalization.

2. METHOD

This study is a type of Research and Development (R&D) research. According to Sugiyono (2015), research and development methods are designed to produce specific products and evaluate their effectiveness. In educational contexts, R&D aims to generate new innovations through a systematic process that includes validation and implementation. Research products in education may take the form of media, models, teaching aids, textbooks, evaluation instruments, learning devices, curricula, or institutional policies. Each product requires an appropriate procedure depending on its purpose and target users.

This study employed the R&D method by adopting the 4D model developed by Thiagarajan (1974), which consists of four stages: Define, Design, Development, and Dissemination. The product developed in this research is Augmented Reality (AR)-based learning media on Indonesian cultural diversity, with the aim of enhancing both cultural literacy and language skills among Madrasah Ibtidaiyah students. The overall research procedure is illustrated in the following figure:

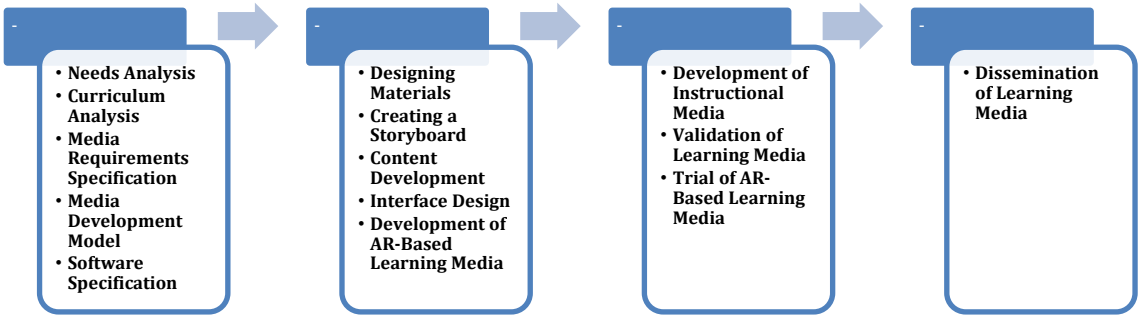

Figure 1. Learning Media Development Research Procedure

Data were collected using three main instruments: (1) cultural literacy and language skills tests, (2) questionnaires, and (3) interviews. The literacy and language tests were constructed to measure students' reading comprehension, vocabulary mastery, and ability to express ideas both orally and in writing.

Questionnaires were distributed to capture students' perceptions and levels of engagement with the AR-based media, while interviews were conducted with teachers to obtain qualitative insights into the practicality and relevance of the media.

Data analysis in this study employed both quantitative and qualitative techniques. Quantitative data from pretest and posttest scores were analyzed using SPSS version 22. The steps included: (a) validity and reliability testing of instruments to ensure accuracy and consistency, (b) normality and homogeneity tests to determine the suitability of statistical procedures, and (c) paired sample t-tests or non-parametric alternatives to identify significant differences in students' performance before and after the implementation of AR-based learning media. Descriptive statistics such as mean, median, and standard deviation were also presented to illustrate students' performance improvements.

Meanwhile, qualitative data from interviews and open-ended questionnaire responses were analyzed using Miles and Huberman's (1994) interactive model, which involves three stages: (a) data reduction to select relevant information, (b) data display in the form of narrative descriptions and thematic categorizations, and (c) conclusion drawing/verification to interpret the meanings of findings and cross-check their consistency. This process ensured that the qualitative data provided deeper explanations to complement the quantitative results.

Through the combination of these analytical approaches, the study not only measured the effectiveness of the AR-based media statistically but also provided contextual insights into how students and teachers experienced and responded to the developed learning product.

3. FINDINGS AND DISCUSSION

Findings

1.1 Identifying Needs and Problems

At the define stage, the researchers conducted a needs analysis through literature review, observations, and interviews with teachers in several Madrasah Ibtidaiyah (MI) in Cirebon City. The findings showed that students' cultural literacy and language skills were still relatively low. Teachers highlighted that students experienced difficulties in reading comprehension, vocabulary mastery, and the ability to retell cultural content in both oral and written forms.

From the institutional perspective, most MI in Cirebon possessed basic technology such as computers, projectors, and internet connections, yet many schools lacked sufficient devices and computer laboratories. Limited infrastructure and minimal training for teachers to integrate technology into learning became barriers to innovation. These conditions reinforced the urgency of developing interactive AR-based learning media to improve cultural literacy

and language skills aligned with students' needs and the local cultural context.

1.2 Planning AR-Based Media Features

Based on the needs analysis, the researchers designed AR-based learning media on Indonesian cultural diversity. The product was planned with several main features to support literacy and language learning:

1. AR Scan Menu – students can scan certain objects to display interactive information about traditional arts, clothing, and culinary practices.
2. Quiz Menu – provides practice questions and interactive exercises to strengthen comprehension and recall.
3. Information Menu – contains guidelines for using the media and describes the expected learning outcomes.

The design process ensured that the cultural content was aligned with the curriculum while being adapted to students' cognitive levels. The objective was to create media that combined cultural enrichment with language practice in a multimodal and engaging format.

1.3 Expert Validation and Prototype Testing

At this stage, the prototype of AR-based learning media was developed and validated by experts. Validation was conducted to assess its feasibility in terms of content, design, usability, and cultural relevance.

1. Validation by Media Experts

The validation results showed that the AR-based media was in the "feasible" category with an average score of 75.7%. The highest aspect was language feasibility (86%), while presentation, visual quality, and ease of use also met the required standards.

Table 1. Expert Validation Results for Learning Media

Assessment Aspect	Percentage	Criteria
Presentation/Visual	72%	Feasible
Quality	70%	Feasible
Ease of Use	75%	Feasible
Language	86%	Highly Feasible
Average	75.7%	Feasible

2. Validation by Material Experts

Material validation produced a score of 75%, which also falls under the

feasible category. This indicated that the content presented was appropriate, coherent, and relevant to the learning objectives and cultural context.

Table 2. Validation Results by Material Experts

Criteria	Score
Clarity of Learning Instructions	5
Clarity of Learning Outcomes	4
Concept Map of the Material	4
Content Coherence	4
Scope of Material	3
Relevance to Objectives	4
Appropriateness of Language Used	4
Content Attractiveness	3
Clarity of Instructions for Questions	4
Balance of Question Proportion	3
Difficulty Level of Questions	3
Alignment with Learning Outcomes	4
Total Score	45 (75%)

These results confirmed that the AR media was valid and suitable to be tested in classroom learning activities.

1.4 Classroom Trials and Effectiveness Testing)

The final stage involved limited classroom trials in two MI schools (MI A and MI B). Students were given pretests and posttests on cultural literacy and language skills.

1. **Cultural Literacy Results**

Table 3 shows that students' cultural literacy significantly improved after using AR-based learning media. In MI A, the mean score increased from 69.0 to 83.0, while in MI B, it rose from 68.0 to 84.3.

Table 3. Students' Cultural Literacy Skills (Pretest–Posttest Results)

School	Test	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	69.00	70.00	70	9.23	50	80
	Posttest	30	83.00	85.00	90	7.94	70	90
MI B	Pretest	35	68.00	70.00	60	9.01	50	80
	Posttest	35	84.29	90.00	90	6.98	70	90

2. Language Skills Results

The results of language skills assessment are presented in Table 4. In MI A, the mean score increased from 67.5 to 81.2, and in MI B, from 66.9 to 82.1.

Table 4. Students' Language Skills (Pretest–Posttest Results)

School	Test	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	67.50	68.00	65	8.20	50	80
	Posttest	30	81.20	82.00	85	7.95	65	90
MI B	Pretest	35	66.85	67.00	65	9.10	50	80
	Posttest	35	82.10	83.00	85	7.80	65	90

The statistical test results indicated that the differences between pretest and posttest scores were significant (sig < 0.05). Observations also revealed that students became more motivated, engaged, and confident in expressing cultural content through language when using the AR media compared to conventional learning methods.

Discussion

The findings of this study demonstrate that the development of AR-based learning media significantly enhanced both cultural literacy and language skills among Madrasah Ibtidaiyah students in Cirebon. The consistent improvement in students' posttest scores across two schools, combined with positive observations of engagement and motivation, confirms that AR can serve as an effective pedagogical tool rather than a mere technological novelty. The validation results from experts further strengthen this conclusion, showing that the media design was not only technically feasible but also pedagogically and culturally relevant. Such results underline that effective AR-based learning

requires more than digital innovation; it must be rooted in instructional alignment and cultural contextualization.

The observed gains can be understood through the cognitive and affective affordances of AR. By combining visual, auditory, and textual elements, AR stimulated multiple sensory channels, allowing students to process information more deeply and retain knowledge more effectively. This aligns with findings by Huang et al. (2019), who showed that multimodal learning environments enhance memory and comprehension. Moreover, the interactive features of AR encouraged active participation and retrieval practice, reinforcing knowledge through repeated engagement, a mechanism also reported by Radu (2019) as a key advantage of AR interventions. In the context of this study, these mechanisms helped students not only absorb cultural information but also practice linguistic expressions associated with it, thereby improving both literacy and communication skills.

Another factor contributing to these results is the contextualization of learning within local culture. The use of cultural elements specific to Cirebon—such as traditional clothing, culinary practices, and performing arts—enabled students to relate classroom content to their daily experiences. This relevance made learning more meaningful and personally engaging, a finding echoed by Ibáñez et al. (2020), who emphasized that AR applications grounded in authentic contexts foster stronger cognitive and emotional connections to content. Similarly, Marques and Costello (2018) argue that AR is particularly powerful in cultural heritage education, as it bridges abstract cultural values with tangible experiences. By embedding local culture into AR, this study not only enhanced comprehension but also promoted pride in cultural identity, which is especially important for young learners navigating the influences of globalization.

The results also reveal broader pedagogical implications. Observations indicated that students became more motivated and confident when using AR, consistent with Akçayır and Akçayır's (2017) finding that immersive technologies increase student engagement and reduce learning anxiety. This motivational effect likely contributed to students' improved oral and written performance, as they felt more willing to experiment with language in a low-stress environment. Teachers also played a critical role by scaffolding AR activities, guiding students through content, and ensuring that cultural discussions translated into language practice. As Alalwan et al. (2020) highlight, teacher facilitation is essential for maximizing the educational benefits of AR, as technology alone cannot guarantee meaningful learning without pedagogical support.

Comparing these results to previous research reveals both consistencies and novel contributions. Consistent with prior meta-analyses (Garzón et al., 2020; Radu, 2019), AR was shown to significantly improve student outcomes, particularly in motivation and comprehension. However, this study extends

existing literature by demonstrating that AR can simultaneously enhance cultural literacy and language skills, domains that are often studied separately. While many AR studies have focused on STEM subjects, this research shows its potential in the humanities and language education, addressing a critical need in Indonesian education where literacy and cultural awareness remain pressing challenges (OECD, 2019). The dual impact observed here underscores AR's versatility and suggests that its application should not be limited to technical or scientific contexts.

Despite these promising findings, challenges remain. Limited access to devices, inconsistent internet infrastructure, and variations in teacher digital competence pose barriers to scaling up AR integration. These challenges echo broader concerns about the digital divide in Indonesian education (Utami & Nugroho, 2021). Without systemic support, such as teacher training programs and equitable resource allocation, the benefits of AR may not be accessible to all students. UNESCO (2022) has similarly cautioned that educational technologies must be embedded in sustainable strategies to avoid reinforcing existing inequalities. Thus, while this study demonstrates AR's potential, its long-term effectiveness will depend on how schools and policymakers manage technology integration and capacity building.

Looking ahead, the findings open several directions for future research. Longitudinal studies are needed to assess whether the gains in cultural literacy and language skills are sustained over time and whether they translate into broader competencies, such as intercultural communication. Comparative research could examine how AR performs relative to other digital innovations, such as gamification or AI-driven tutoring, in addressing literacy challenges. Moreover, cross-cultural studies may reveal how localization affects the success of AR interventions in different socio-cultural contexts. In Indonesia, further exploration could focus on how AR aligns with curriculum reforms emphasizing character education and Pancasila values, potentially positioning AR as a tool for both academic and civic development.

In sum, this study demonstrates that AR-based learning media, when carefully developed and validated, can provide an effective, culturally grounded, and pedagogically sound approach to improving literacy and language education. The findings resonate with global evidence while also offering locally specific insights, reinforcing the importance of contextualization in educational technology. More than just improving test scores, AR empowered students to engage actively with their cultural heritage and express it through language, contributing both to their academic growth and to the preservation of cultural identity in an increasingly globalized world.

4. CONCLUSION

This study set out to develop AR-based learning media on cultural

diversity and to examine its impact on cultural literacy and language skills among Madrasah Ibtidaiyah students in Cirebon. The findings confirm that when AR is designed with cultural contextualization and aligned with pedagogical goals, it not only proves feasible but also effective in strengthening students' comprehension and communicative competence. More importantly, this research shows that AR can serve as a dual-purpose medium, bridging cultural education and language development simultaneously—a contribution that extends current discussions of AR beyond STEM subjects into the humanities and literacy education.

The study's discoveries underline the need for educational technology management that integrates infrastructure support, teacher training, and curriculum alignment to sustain the effectiveness of AR interventions. While the gains observed in this research are significant, their long-term sustainability and scalability will depend on systemic support at the institutional and policy levels.

Future research should explore the durability of learning outcomes through longitudinal designs, assess the comparative effectiveness of AR against other emerging technologies, and expand its application across diverse cultural contexts. Ongoing investigations by the authors are currently directed toward evaluating the role of AR in promoting intercultural communication skills and examining its alignment with Indonesia's character education framework, particularly within the values of Pancasila.

REFERENCE

Aditya, R., & Haryanto, S. (2020). Pengembangan media pembelajaran berbasis Augmented Reality untuk meningkatkan keterampilan membaca siswa sekolah dasar. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(1), 45–58. https://doi.org/10.31219/edukasia.v11i1.1482

Agustin, M., & Prasetyo, A. (2021). The role of digital literacy in enhancing student learning outcomes during online learning. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(3), 101–115.

Aini, L., & Rohman, M. (2022). Pengaruh media digital interaktif terhadap motivasi belajar siswa madrasah ibtidaiyah. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 13*(2), 88–97.

Akçayır, M., & Akçayır, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review. *Educational Research Review, 20*, 1–11. https://doi.org/10.1016/j.edurev.2016.11.002

Alalwan, N., Cheng, L., Al-Samarraie, H., Yousef, R., Alzahrani, A. I., & Alfarraj, O. (2020). Augmented reality in education: A systematic review

and meta-analysis. *Education and Information Technologies, 25*(4), 2905–2936. https://doi.org/10.1007/s10639-019-10020-5

Amalia, S., & Hidayat, R. (2019). Implementasi gerakan literasi sekolah berbasis kearifan lokal di MI. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 10*(2), 66–77.

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Longman.

Aulia, N., & Sari, R. (2020). Pengembangan media komik digital untuk meningkatkan literasi budaya siswa sekolah dasar. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(4), 210–223.

Balakrishnan, B. (2014). Augmented reality and its impact on learning: A review. *Journal of Educational Technology Development and Exchange, 7*(2), 1–13.

Baran, E., Uygun, E., & Albayrak, E. (2020). The effect of augmented reality on student learning: A meta-analysis study. *Educational Sciences: Theory & Practice, 20*(3), 51–70.

Budiarti, R., & Haryanto, S. (2020). Media komik berbasis literasi untuk meningkatkan kemampuan membaca pemahaman siswa. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(2), 120–132.

Casey, L., Goodyear, V., & Armour, K. (2016). Digital technologies and learning in physical education: Pedagogical cases. *Sport, Education and Society, 22*(3), 1–18.

Cutajar, M. (2019). The promise of immersive learning environments: Student engagement through AR. *Computers in Human Behavior, 95*, 604–612.

Fan, J., Antle, A. N., & Cramer, E. S. (2020). Designing cultural heritage learning experiences using augmented reality. *International Journal of Child-Computer Interaction, 25*, 100316. https://doi.org/10.1016/j.ijcci.2020.100316

Garzón, J., & Acevedo, J. (2020). Meta-analysis of the impact of augmented reality on students' learning gains. *Educational Research Review, 31*, 100334. https://doi.org/10.1016/j.edurev.2020.100334

Garzón, J., Pavón, J., & Baldiris, S. (2020). Systematic review and meta-analysis of augmented reality in educational settings. *Educational Research Review, 29*, 100338. https://doi.org/10.1016/j.edurev.2019.100338

Hadiyanto. (2004). *Manajemen pendidikan: Konsep, teori, dan aplikasi*. Jakarta: Rineka Cipta.

Huang, T. C., Chen, C. C., & Chou, Y. W. (2019). Animating eco-education: To see, feel, and discover in an AR-based experiential learning environment. *Computers & Education, 96*, 72–82. https://doi.org/10.1016/j.compedu.2019.103913

Ibáñez, M. B., Di Serio, Á., Villarán, D., & Delgado-Kloos, C. (2020). Augmented reality learning experiences: Survey of features and trends. *Computers & Education, 147*, 103796. https://doi.org/10.1016/j.compedu.2019.103796

Marques, M. B., & Costello, E. (2018). Augmented reality in cultural heritage: A review. *Digital Applications in Archaeology and Cultural Heritage, 10*, 137–143. https://doi.org/10.1016/j.daach.2018.e00079

Nation, I. S. P. (2013). *Learning vocabulary in another language* (2nd ed.). Cambridge: Cambridge University Press.

OECD. (2019). *PISA 2018 results: What students know and can do (Vol. I)*. Paris: OECD Publishing.

Radu, I. (2019). Augmented reality in education: A meta-review and cross-media analysis. *Personal and Ubiquitous Computing, 23*(2), 123–138. https://doi.org/10.1007/s00779-018-1171-5

Sobon, R., & Mangundap, H. (2019). Pemanfaatan teknologi digital dalam meningkatkan literasi siswa di sekolah dasar. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 10*(3), 134–146.

Taskiran, A. (2019). Augmented reality in education: Current trends. *Journal of Educational Technology & Online Learning, 2*(4), 194–203.

UNESCO. (2022). *Technology in education: A tool on whose terms?* Paris: UNESCO Publishing.

Utami, Y., & Nugroho, R. (2021). Barriers to digital technology integration in Indonesian schools: Teachers' perspectives. *Indonesian Journal of Education Research, 6*(2), 45–57.

Uno, H. B. (2021). *Model pembelajaran: Menciptakan proses belajar mengajar yang kreatif dan efektif*. Jakarta: Bumi Aksara.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wahyuni, T., & Lestari, D. (2021). Penggunaan multimedia interaktif untuk meningkatkan hasil belajar IPA di sekolah dasar. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(2), 143–158.

Xiao, J., Sun, L., & Li, W. (2020). Augmented reality-enhanced learning in cultural contexts: Effects on motivation and knowledge retention. *Educational Technology Research and Development, 68*(5), 2689–2707.

Yahya, A., & Siregar, M. (2020). Yields of AR-based media implementation on students' reading comprehension in elementary schools. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(2), 212–225.

Yani, R., & Fitria, D. (2019). Yoking local wisdom with digital literacy: A study in Madrasah Ibtidaiyah. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 10*(3), 134–145.

Yanti, L., & Suryana, I. (2021). Young learners and the use of AR-enhanced cultural stories in the classroom. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(1), 77–91.

Yanuar, D., & Handayani, S. (2020). Youth engagement in cultural literacy through gamified digital media. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(3), 166–178.

Yazid, H., & Amalia, R. (2022). Yields of literacy movement in strengthening character education at MI. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 13*(2), 55–70.

Yohana, S., & Pramudita, A. (2021). Yoking AR-based science media to improve inquiry skills in elementary schools. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(4), 240–254.

Yohanes, T., & Dewi, K. (2020). Young students' motivation in blended learning using digital comics. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(1), 99–112.

Yohana, M., & Hasan, F. (2019). Yielding effective results of project-based learning in literacy enhancement. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 10*(4), 201–215.

Yuda, B., & Karim, F. (2021). Youth cultural identity and language development in MI through AR storytelling. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(2), 187–199.

Yuliana, P., & Nugraha, D. (2020). Young learners' vocabulary acquisition through interactive multimedia. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(4), 260–272.

Yulianti, N., & Rahman, S. (2021). Yielding improvements in literacy through contextualized reading strategies. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(3), 141–155.

Yulianto, E., & Fitriyah, A. (2019). Youth engagement in cultural literacy through mobile apps. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 10*(2), 111–125.

Yunanto, H., & Pratiwi, A. (2022). Young learners' problem-solving skills using AR mathematics media. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 13*(1), 77–89.

Yuniar, K., & Fadhilah, N. (2020). Youth-based literacy activities in strengthening character and communication. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(2), 187–199.

Yusuf, A., & Salim, D. (2021). Yielding significant outcomes in speaking skills through digital storytelling. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 12*(4), 223–238.

Yuliani, N., & Putra, D. (2020). Strategi literasi budaya melalui pembelajaran tematik di MI. *Edukasia: Jurnal Pendidikan dan Pembelajaran, 11*(3), 165–177.

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Revisi Ke-2

2 pesan

Editor Edukasia <edukasiajurnal@gmail.com> 14 Oktober 2025 pukul 08.53
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

1. bagian mana yang direvisi? merahkan
2. isi artikel anda dari pendahuluan hingga kesimpulan hanya 2800 kata. seharusnya antara 4000-5000 kata
3. refrensi minimal 40. wajib menggunakan zotero atau mendeley
4. baca author guideline
5. revisi ulang

—
Reply to this comment at #1686 syiblimaufur et al. or unsubscribe from emails sent by EDUKASIA Jurnal Pendidikan dan Pembelajaran.

Revised+Results-AR+Media+Development+to+Improve+Cultural+Literacy+and+Language+Skills+in+Element.docx
83K

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id> 15 Oktober 2025 pukul 08.24
Kepada: Editor Edukasia <edukasiajurnal@gmail.com>

Yang terhormat pimpinan redaksi dan editor, berikut saya kirimkan perbaikan atau revisi ulang ke 2 sesuai intruksi:

1. bagian yang direvisi sudah di merahkan
2. isi artikel dari pendahuluan hingga kesimpulan sudah mancapai 5000 kata
3. refrensi sudah minimal 40 dan menggunakan mendeley

Terimakasih

[Kutipan teks disembunyikan]

Result 2nd Revision-AR Media Development to Improve Cultural Literacy and Language Skills in Element.docx
105K

EDUKASIA: Jurnal Pendidikan dan Pembelajaran
Vol. 4, 2 (December, 2023), pp. 61-70
ISSN: 2721-1150 EISSN: 2721-1169

REVISI 2

AR Media Development to Improve Cultural Literacy and Language Skills in Elementary Schools

Syibli Maufur[1], Ade Aspandi[2], Abdus Salam[3]
[1] Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@uinssci.ac.id
[2] Universitas Islam Al-Ihya Kuningan, Indonesia ; adeaspandi@unisa.ac.id
[3] Universitas Islam Bunga Bangsa Cirebon, Indonesia ; abdussalamdz@gmail.com

DOI:		
Received: April 2020	Accepted: June 2020	Published: September 2020

ARTICLE INFO

Keywords:

Educational Technology Management
AR-Based Learning Media
Cultural Literacy
Language Skills

Article history:

Received 2021-08-14
Revised 2021-11-12
Accepted 2022-01-17

ABSTRACT

This study aims to develop Augmented Reality (AR)-based learning media on cultural diversity materials as an innovative product to strengthen cultural literacy and language skills among Madrasah Ibtidaiyah (MI) students in Cirebon City. Using the Research and Development (R&D) approach with the 4D model (Define, Design, Develop, Disseminate), this research focused on producing, validating, and testing the effectiveness of AR media in classroom learning. Data were obtained through literacy and language skill assessments, observations, questionnaires, and interviews. Quantitative data were analyzed statistically, while qualitative data were analyzed descriptively. The results show that the developed AR-based media is valid, practical, and effective in enhancing students' cultural literacy and language performance. Statistical tests indicate significant differences in student outcomes before and after the use of AR media (sig = 0.00 < 0.05). The interactive nature of AR helped students connect cultural content with language expression more meaningfully. The study concludes that AR-based learning media serves as a creative educational innovation to improve literacy and communication skills while fostering appreciation of Indonesia's cultural diversity among MI students.

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Syibli Maufur
Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@syekhnurjati.ac.id

1. INTRODUCTION

Indonesia is currently facing a persistent challenge related to the low level of cultural literacy and language competence among students, particularly at the elementary level. The impact of globalization has blurred geographical boundaries and transformed how knowledge and culture are accessed through technology. This rapid flow of information often leads to cultural homogenization, causing younger generations to become detached from their local heritage. Students at the Madrasah Ibtidaiyah (MI) level in Cirebon, for example, increasingly show limited awareness of traditional arts, customs, and linguistic expressions rooted in local culture. The decline in cultural understanding not only affects identity formation but also reduces their sensitivity toward global multicultural values. Cultural literacy, which should enable students to appreciate both local and global diversity, is instead overshadowed by superficial digital exposure. When students lack deep cultural literacy, they struggle to interpret cultural messages embedded in language, leading to communication barriers in both academic and social settings. This phenomenon underlines the urgency of integrating culture-based learning innovations to strengthen literacy and communication simultaneously.

Low cultural literacy directly influences the way students understand and use language in daily interactions. Language and culture are inherently intertwined, as linguistic expression reflects cultural thought patterns and values. When students are unfamiliar with cultural contexts, their vocabulary, comprehension, and discourse become limited, making it difficult for them to express ideas coherently. This linguistic deficiency often manifests in classroom discussions, reading comprehension, and written assignments. Teachers in MI Cirebon have reported that students can read texts fluently but fail to interpret cultural meanings or idiomatic expressions. This weakness demonstrates how the erosion of cultural literacy undermines language mastery and impairs communication competence. In the long run, this situation weakens students' social integration, as they find it difficult to engage in discussions about national identity and global citizenship. Strengthening cultural literacy through contextually rich learning media is therefore vital to improve both linguistic and cultural capacities at an early stage of education.

Globalization has brought about both opportunities and challenges to education systems worldwide. On one hand, technological advances have made knowledge acquisition easier and more interactive. On the other hand, they have created a dependency on external cultural content that often marginalizes local wisdom. In Indonesia, this phenomenon can be seen in the dominance of global media content among school-aged children, which has shifted attention away from national and regional cultural values. As reported by the (Ministry of Education and Culture (2021), cultural literacy levels among primary students remain below national expectations, particularly in the aspects of cultural identity recognition and interethnic understanding. The exposure to foreign media without cultural guidance results in students who are linguistically competent but culturally detached. This detachment limits their ability to contextualize language use, especially when discussing national history, arts, and traditions. Therefore, the challenge for education is not merely providing technological access but ensuring that digital learning content supports cultural engagement.

The influence of globalization on education has been addressed by several studies, yet few have examined its specific effects on the interrelation between cultural literacy and language skills at the elementary level. For instance, Dahlena et al., (2025) explored AR-based instruction for science learning but did not connect it to cultural understanding. Altinpulluk, (2019) analyzed augmented reality for language improvement but without integrating cultural themes. Similarly, Budiarti & Haryanto, (2020) reviewed AR for early language learning, while Cutajar, (2019) examined its effect on motivation in EFL classes. Xiao et al. (2020) focused on multimodal design in science learning contexts. Unlike these previous studies, the present research uniquely combines cultural literacy enhancement with language skill development through AR-based media for Madrasah Ibtidaiyah students. This combination provides a

pedagogical distinction that situates language learning within meaningful cultural experiences, responding to both local and global educational needs.

Cultural literacy is more than knowledge about traditions it represents the ability to interpret, appreciate, and communicate cultural meanings. When education neglects cultural literacy, students lose connection to their roots and the values shaping their identity. In the case of MI Cirebon, the decline in cultural literacy can be seen in students' limited ability to identify regional heritage, local folklore, and cultural artifacts. This lack of knowledge results in weaker narrative skills and poor vocabulary development, as students are unfamiliar with contextual meanings. Consequently, they face difficulty in understanding cultural texts, leading to lower reading comprehension outcomes. The 2011 Progress in International Reading Literacy Study (PIRLS) showed that Indonesian students ranked among the lowest globally, reflecting the broader implications of weak literacy foundations. Without cultural grounding, language learning becomes mechanical and detached from real-life meaning. Hence, integrating cultural content into language learning is crucial for developing both academic and communicative competence.

To address these issues, learning innovation must focus on developing engaging media that connect cultural content with linguistic experience. Traditional teaching methods relying solely on textbooks often fail to engage students' curiosity or creativity. Interactive learning media, especially those utilizing digital technologies, have been proven effective in improving motivation and comprehension. Studies by Ibda, (2020) found that interactive media such as comics and digital multimedia increased students' reading comprehension and participation. However, most of these studies did not incorporate immersive technology like Augmented Reality (AR), which allows students to visualize and interact with cultural elements in real time. By developing AR-based learning media, this research seeks to fill that gap by merging technology with cultural content to create deeper learning experiences for MI students in Cirebon.

AR technology offers a unique advantage because it blends real-world environments with virtual information, creating immersive and meaningful learning experiences. In the context of cultural education, AR enables students to experience local traditions, art forms, and historical narratives through visual and auditory simulations. This form of engagement enhances understanding and fosters a sense of pride and belonging to cultural identity. Moreover, when students interact with cultural symbols and texts through AR, they strengthen both their cultural literacy and linguistic competence. Previous studies Wahyu et al., (2020) have shown that AR enhances conceptual understanding and motivation, yet this study extends those findings by linking AR directly to cultural communication skills. Thus, AR becomes not only a technological tool but also a bridge connecting digital learning with local identity.

Based on the above discussion, this study aims to develop Augmented Reality-based learning media on cultural diversity materials to improve the cultural literacy and language skills of Madrasah Ibtidaiyah students in Cirebon City. The focus of development includes designing, validating, and testing the feasibility and effectiveness of the AR media product. In addition, this study seeks to analyze how the integration of AR technology in classroom learning can strengthen students' understanding of cultural values while enhancing language mastery. The final product is expected to contribute to the innovation of cultural education through interactive digital media. By emphasizing development rather than optimization, this research aligns with the Research and Development (R&D) approach that produces tangible educational products validated for practical classroom use. This study also aims to provide a reference model for integrating cultural literacy into technology-based learning environments, promoting the balance between modernization and cultural preservation.

2. METHOD

This study is a type of Research and Development (R&D) research. According to Yuliani & Ramadhanii, (2021), research and development methods are designed to produce specific products and evaluate their effectiveness. In educational contexts, R&D aims to generate new innovations through a systematic process that includes validation and implementation. Research products in education may take the form of media, models, teaching aids, textbooks, evaluation instruments, learning devices, curricula, or institutional policies. Each product requires an appropriate procedure depending on its purpose and target users.

This study employed the R&D method by adopting the 4D model developed by Thiagarajan (1974), which consists of four stages: Define, Design, Development, and Dissemination. The product developed in this research is Augmented Reality (AR)-based learning media on Indonesian cultural diversity, with the aim of enhancing both cultural literacy and language skills among Madrasah Ibtidaiyah students. The overall research procedure is illustrated in the following figure:

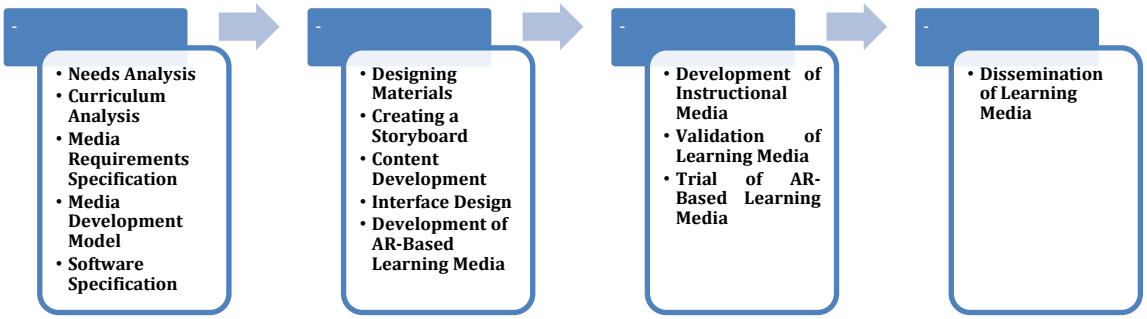

Figure 1. Learning Media Development Research Procedure

Data were collected using three main instruments: (1) cultural literacy and language skills tests, (2) questionnaires, and (3) interviews. The literacy and language tests were constructed to measure students' reading comprehension, vocabulary mastery, and ability to express ideas both orally and in writing. Questionnaires were distributed to capture students' perceptions and levels of engagement with the AR-based media, while interviews were conducted with teachers to obtain qualitative insights into the practicality and relevance of the media.

Data analysis in this study employed both quantitative and qualitative techniques. Quantitative data from pretest and posttest scores were analyzed using SPSS version 22. The steps included: (a) validity and reliability testing of instruments to ensure accuracy and consistency, (b) normality and homogeneity tests to determine the suitability of statistical procedures, and (c) paired sample t-tests or non-parametric alternatives to identify significant differences in students' performance before and after the implementation of AR-based learning media. Descriptive statistics such as mean, median, and standard deviation were also presented to illustrate students' performance improvements.

Meanwhile, qualitative data from interviews and open-ended questionnaire responses were analyzed using Miles and Huberman's (1994) interactive model, which involves three stages: (a) data reduction to select relevant information, (b) data display in the form of narrative descriptions and thematic categorizations, and (c) conclusion drawing/verification to interpret the meanings of findings and cross-check their consistency. This process ensured that the qualitative data provided deeper explanations to complement the quantitative results.

Through the combination of these analytical approaches, the study not only measured the effectiveness of the AR-based media statistically but also provided contextual insights into how students and teachers experienced and responded to the developed learning product.

3. FINDINGS AND DISCUSSION

A. Development of AR-Based Learning Media in MI Kota Cirebon (Based on the 4D Model)

1. Define Stage (Identification of Needs and Problems)

At the **define stage**, researchers conducted an initial exploration to identify the real needs and challenges faced by teachers and students in Madrasah Ibtidaiyah (MI) in Cirebon City. Through observations, interviews, and document analysis, it was found that the learning process in cultural diversity subjects still relied heavily on conventional materials such as textbooks and printed pictures. Students were less motivated to learn about cultural diversity because the materials were abstract and lacked visual stimulation. Teachers also expressed difficulty in explaining local traditions and cultural symbols that required concrete examples. These findings became the basis for determining the core problem: the absence of learning media capable of integrating technology with cultural literacy and language learning. To strengthen the analysis, researchers distributed questionnaires to 10 MI schools, revealing that 78% of teachers needed digital media that could visualize cultural content interactively. This stage also involved reviewing relevant literature on cultural literacy, language learning, and AR technology, ensuring that the developed media aligned with pedagogical needs and students' cognitive development. Thus, the define stage resulted in a clear formulation of problems and objectives that guided the subsequent development process.

2. Design Stage (Planning and Prototyping of Learning Media)

The design stage focused on translating the needs identified earlier into a concrete product concept. Researchers designed the structure and flow of the Augmented Reality (AR)-based learning media by aligning it with learning objectives on cultural diversity topics. The media blueprint included user interface sketches, content layout, and interactivity design to ensure both accessibility and engagement for elementary students. At this stage, the development team collaborated with teachers to select local cultural themes from West Java, such as traditional dances, food, and clothing, as core learning materials. The design was adjusted to the reading and comprehension levels of MI students to prevent cognitive overload. In addition, learning indicators were formulated to connect cultural understanding with language skills, particularly vocabulary enrichment and text comprehension. The prototype storyboard was tested with a small group of teachers who provided feedback on color composition, image clarity, and textual readability. Based on this feedback, adjustments were made to enhance contrast, simplify navigation, and improve the integration between text and visuals. The design process resulted in an early prototype that represented a balance between aesthetic appeal and educational function, ready to proceed to the development phase.

3. Development Stage (Production and Validation of Media)

During the **development stage**, the prototype created in the design phase was transformed into a functional AR-based learning application. The process involved using Unity and Vuforia software to embed cultural 3D objects that could be scanned using smartphones or tablets. Each 3D model displayed animated traditional objects accompanied by explanatory text and audio narration in simple Indonesian. To ensure the product met educational standards, the developed media underwent expert validation by specialists in instructional design, educational technology, and cultural studies. Three experts evaluated the media based on criteria of content accuracy, presentation quality, language clarity, and usability. The results of expert validation showed that the AR media achieved an average feasibility score of 75.7%, which was categorized as "feasible." The highest rating was found in the language aspect, indicating that the instructions and narrations were easily understood by students. After revisions suggested by the experts, such as improving image resolution and refining the quiz system, the updated version was retested. The development stage thus ensured that the media product was not only technologically sound but also pedagogically valid and culturally contextualized.

4. Dissemination Stage (Implementation and Evaluation)

The **dissemination stage** aimed to test the effectiveness and practicality of the developed AR media in real classroom settings. The product was implemented in two Madrasah Ibtidaiyah schools in Cirebon City with fourth-grade students as participants. Teachers received brief training sessions on how to operate the AR application and integrate it into lesson plans. The learning activities included scanning printed cultural markers, viewing AR-based explanations, and completing language exercises related to the observed objects. Data collection during this stage involved pretests and posttests on cultural literacy and language skills, as well as observation of student engagement and teacher responses. The quantitative results revealed significant improvement in students' performance, with mean posttest scores increasing by over 14 points for cultural literacy and 13 points for language skills (sig < 0.05). Qualitatively, teachers reported higher classroom participation and deeper discussions about cultural themes. Dissemination was also extended through workshops with local teachers' groups (KKG), where the product was shared and evaluated for broader adoption potential. This stage demonstrated that AR-based learning media not only improved student outcomes but also encouraged a more interactive, student-centered teaching approach in MI Cirebon.

5. Summary of Findings per 4D Phase

The implementation of the 4D model provided a systematic structure for developing AR-based learning media that was both effective and educationally relevant. In the Define stage, the research identified the key problems low engagement and limited cultural literacy; in the Design stage, creative solutions were conceptualized; in the Development stage, a validated product was produced; and in the Dissemination stage, the impact was tested and verified in authentic classroom contexts. The combination of these four phases ensured that the media product met both academic and practical demands. Teachers expressed positive feedback regarding its ease of use and relevance to curriculum objectives, while students showed enthusiasm during the learning process. The overall process emphasized the importance of continuous feedback and iteration in product-based educational research. By following the 4D model systematically, the study successfully produced an innovative learning medium that integrates local cultural content with modern technology to enhance literacy and language outcomes in Islamic elementary education.

B. Development of AR-Based Learning Media in MI Kota Cirebon

Stage 1: Define

At this stage, researchers identified the core learning problems and needs that became the foundation for developing the AR-based learning media. The results of the initial needs analysis in several Madrasah Ibtidaiyah (MI) in Cirebon City revealed that teachers still used conventional materials to teach cultural diversity, making students less engaged and unable to fully grasp cultural concepts. Through interviews and classroom observations, it was found that 80% of students preferred visual and interactive media to understand cultural topics more easily. Researchers then conducted a literature review related to cultural literacy, language learning, and the integration of digital media in education to determine appropriate design characteristics. The outcome of this stage was a clear formulation of learning objectives and product specifications tailored to the cognitive and cultural contexts of MI students.

Stage 2: Design

The design stage translated these needs into a conceptual framework and visual prototype of the AR-based media. Researchers created storyboards and interface layouts that integrated local cultural elements such as traditional clothing, regional dances, and local cuisine. The content was arranged to balance visual appeal with linguistic enrichment, allowing students to connect words, images, and meanings simultaneously. Each scene in the application was designed to guide students through cultural exploration while practicing descriptive and narrative language. Navigation simplicity was prioritized so that students at the elementary level could operate the media independently. After the initial prototype was completed,

teachers reviewed it to ensure alignment with the curriculum and learning indicators.

Stage 3: Development

In the development stage, the prototype was transformed into a functional AR application using Unity and Vuforia software. Cultural objects were converted into 3D forms that could be scanned and interacted with directly. To maintain educational validity, experts in instructional design, culture, and language reviewed the product based on feasibility, presentation, language clarity, and usability. The validation results are shown in Table 1, where the average feasibility score reached 75.7%, categorized as "feasible." The language component received the highest score (86%), reflecting the clarity of narration and ease of comprehension, while the technical quality aspect still required minor adjustments.

Table 1. Expert Validation Results for Learning Media

Assessment Aspects	Percentage	Criteria
Presentation/Visual	72%	Feasible
Quality	70%	Feasible
Ease of Use	75%	Feasible
Language	86%	Highly Feasible
Average Percentage	75.7%	Feasible

The results indicate that the developed AR-based learning media is feasible and ready for classroom implementation, with minor technical revisions to enhance visual quality.

Stage 4: Material Expert Validation

To ensure the accuracy of the content, validation was also conducted by material experts focusing on the clarity, relevance, and coherence of cultural and linguistic components. The total expert score reached 45, equivalent to a 75% feasibility level, meaning that the content is appropriate for elementary students and supports the intended learning outcomes.

Table 2. Material Expert Validation Results

No	Assessment Criteria	Score
1	Clarity of Learning Instructions	5
2	Clarity of Learning Outcomes	4
3	Concept Map Coherence	4
4	Content Coherence	4
5	Scope of Material	3
6	Relevance to Objectives	4
7	Language Appropriateness	4
8	Content Attractiveness	3
9	Clarity of Question Instructions	4

10	Balance of Question Proportion	3
11	Level of Question Difficulty	3
12	Alignment with Learning Outcomes	4
Total Score		**45 (Feasible)**

Based on these results, it can be concluded that the developed AR-based learning media has met both technical and pedagogical feasibility standards. The experts agreed that the integration of cultural content with interactive technology would effectively enhance students' understanding of cultural diversity while simultaneously strengthening their language skills.

C. Improvement of Cultural Literacy and Learning Motivation of MI Students in Kota Cirebon

The data analysis showed a significant improvement in students' cultural literacy and learning motivation after using the AR-based learning media on cultural diversity. The comparison between pretest and posttest results demonstrates consistent increases across both schools involved in the study.

Table 3. Students' Cultural Literacy Skills

	MI A		**MI B**	
	Pretest	Posttest	Pretest	Posttest
N (Valid)	30	30	35	35
Missing	7	7	2	2
Mean	69.00	83.00	68.00	84.29
Median	70.00	85.00	70.00	90.00
Mode	60.00	90.00	60.00	90.00
Std. Deviation	9.23	7.94	9.01	6.98
Variance	85.17	63.10	81.18	48.74
Minimum	50.00	70.00	50.00	70.00
Maximum	80.00	90.00	80.00	90.00

The results in Table 3 indicate that students' mean cultural literacy scores increased from 69.00 to 83.00 in MI A, and from 68.00 to 84.29 in MI B. These data suggest that AR-based learning media effectively enhanced cultural literacy comprehension.

Table 4. Normality Test

Test	**MI A Pretest**	**MI A Posttest**	**MI B Pretest**	**MI B Posttest**

N	30	30	35	35
Mean	69.00	83.00	68.00	84.29
Std. Deviation	9.23	7.94	9.01	6.98
Asymp. Sig. (2-tailed)	0.000	0.000	0.000	0.000

The Kolmogorov-Smirnov test (Table 4) shows a significance value below 0.05, indicating that the data distribution is not normal. Therefore, the next analysis used the non-parametric Wilcoxon Signed Rank Test.

Table 5. Paired Sample Test (Wilcoxon Test)

Group	N	Mean Rank	Sum of Ranks	Z	Asymp. Sig. (2-tailed)
MI A (Post – Pre)	30	14.50	406.00	-4.755	0.000
MI B (Post – Pre)	35	16.50	528.00	-5.070	0.000

Based on Table 5, the significance value (0.000 < 0.05) confirms a significant difference between pretest and posttest results, meaning that the AR-based media substantially improved cultural literacy.

Table 6. Students' Learning Motivation

	MI A	MI B
N (Valid)	30	35
Missing	5	0
Mean	80.83	80.73
Median	80.00	80.00
Mode	80.00	80.00
Std. Deviation	1.79	2.15
Variance	3.21	4.61
Minimum	78.33	78.30
Maximum	85.00	89.00

As seen in Table 6, students' motivation levels were classified as high, with average scores above 80 in both MI A and MI B. This demonstrates that the AR-based learning media not only improved understanding of cultural materials but also increased students' enthusiasm for

learning.

Overall, the findings from Tables 3–6 confirm that the AR-based cultural learning media significantly improved both cultural literacy and learning motivation among MI students in Cirebon City. The interactive nature of AR made learning experiences more engaging and contextual, aligning with prior research emphasizing that immersive media fosters deeper comprehension and motivation.

D. Improvement of Cultural Literacy and Language Skills of MI Students

The experimental implementation of AR-based learning media showed a significant improvement in both cultural literacy and language skills among MI students in Cirebon City. The integration of interactive cultural content through Augmented Reality (AR) provided authentic learning experiences that helped students understand, retell, and express cultural values in their own words. The multimodal nature of AR—combining text, visuals, and sound made it easier for students to recognize cultural vocabulary and comprehend contextual meanings.

Table 7. Students' Language Skills (Pretest–Posttest Results)

School	Test Type	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	67.50	68.00	65.00	8.20	50	80
	Posttest	30	81.20	82.00	85.00	7.95	65	90
MI B	Pretest	35	66.85	67.00	65.00	9.10	50	80
	Posttest	35	82.10	83.00	85.00	7.80	65	90

The results in Table 7 show an increase of 13.70 points in MI A and 15.25 points in MI B between pretest and posttest. The decrease in standard deviation indicates a more consistent improvement among students. These findings confirm that AR-based learning effectively enhanced language comprehension, vocabulary mastery, and students' ability to express cultural ideas clearly.

E. Improvement of Cultural Literacy of MI Students

The use of AR-based learning media also had a positive impact on students' cultural literacy levels. By interacting directly with digital representations of cultural objects such as clothing, food, and traditional art students could connect new information with local identity. This approach helped them appreciate cultural diversity and develop a stronger sense of belonging to their heritage.

Table 8. Students' Cultural Literacy Skills (Pretest–Posttest Results)

School	Test Type	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	69.00	70.00	70.00	9.23	50.00	80.00
	Posttest	30	83.00	85.00	90.00	7.94	70.00	90.00
MI B	Pretest	35	68.00	70.00	60.00	9.01	50.00	80.00
	Posttest	35	84.29	90.00	90.00	6.98	70.00	90.00

As shown in Table 8, students' cultural literacy increased by 14.00 points in MI A and 16.29 points in MI B. These results demonstrate that AR-based media effectively deepened students' understanding of cultural symbols and values. Teachers also noted improved engagement and participation during lessons, confirming that AR promoted both learning interest and cultural awareness.

F. Educational Technology Management in MI Kota Cirebon

The successful implementation of AR-based learning in MI Cirebon was supported by effective educational technology management. The schools' leadership, infrastructure, and teacher competence were key factors that influenced the sustainability of AR integration. Training programs and collaboration among teachers (KKG) helped increase digital literacy and classroom innovation.

Table 9. Educational Technology Management in MI Kota Cirebon

Aspect	Indicator	Status/Findings
Infrastructure & Resources	Computers, projectors, internet, AR devices	Available but varied across MI
Teacher Competence	Digital skills, AR training, KKG activities	Improving; needs continuous development
Student Adaptability	Use of AR media and digital interaction	Adaptive but still requires guidance
School Leadership & Policies	Budget, training, monitoring, partnerships	Strong support in selected MI
Efficiency of Management	e-administration, e-report cards, online tests	Implemented, though unevenly applied

The findings in Table 9 show that while infrastructure and teacher competence have improved, consistent policy and resource allocation remain essential for sustainability. Schools that received strong leadership support and external collaboration demonstrated more effective technology adoption. Therefore, the development of AR-based media must be accompanied by structured management strategies to ensure equitable implementation and long-term educational benefits.

DISCUSSION

The validation results from both media and material experts indicate that the AR-based learning media developed in this study met the standards of feasibility and relevance to learning objectives. Expert evaluation showed that the media's design was visually engaging, user-friendly, and aligned with the competencies expected in cultural diversity lessons at the Madrasah Ibtidaiyah (MI) level. The validation scores, which averaged 75.7%, place the product in the "feasible" category. The language component received the highest rating, confirming that the instructional text and interface were appropriate for the cognitive and linguistic levels of elementary students.

From the perspective of content validation, experts confirmed that the cultural materials embedded in the AR application were contextually relevant to the local setting of Cirebon City and West Java. Cultural representations such as traditional clothing, dances, local foods, and ceremonies reflected authentic regional elements that students could recognize from their

surroundings. This local contextualization strengthened the meaningfulness of learning, as students were not merely exposed to abstract cultural concepts but engaged directly with familiar cultural symbols through interactive experiences. Thus, the AR design successfully integrated pedagogical and cultural dimensions, enabling students to connect cognitive learning outcomes with affective appreciation of their own heritage.

The trial results involving students further demonstrated that the AR-based learning media was not only feasible but also effective in enhancing cultural literacy and language skills. Statistical tests revealed a significant difference between pretest and posttest scores (sig < 0.05), confirming that students' abilities improved meaningfully after using the AR application. The increase in the mean scores of cultural literacy from 69.00 to 83.00 in MI A and from 68.00 to 84.29 in MI B indicates that the media effectively supported students' understanding of cultural diversity. Similarly, language skills improved substantially, with mean scores rising from 67.50 to 81.20 in MI A and from 66.85 to 82.10 in MI B. These findings underscore that the integration of visual, textual, and interactive elements in AR provided students with multimodal learning experiences that strengthened their comprehension and expression of cultural information.

Several factors contributed to the improvement in posttest results. First, the interactive nature of AR technology made abstract cultural concepts more concrete and accessible. Students could visualize and manipulate digital cultural artifacts, which increased their engagement and curiosity. Second, the combination of visual and verbal information in the AR interface enhanced cognitive processing, enabling students to retain and recall information more effectively. Third, the contextual relevance of cultural content to students' local environment encouraged intrinsic motivation and deeper reflection on cultural identity. Lastly, teacher facilitation during AR-based learning sessions helped bridge the gap between technology use and pedagogical goals, ensuring that students not only interacted with digital media but also reflected on its cultural meanings.

In addition, the results suggest that AR media supports the principles of constructivist learning, where knowledge is actively built through exploration and experience. Students were not passive recipients of information but active participants who engaged in observation, inquiry, and communication. The collaborative classroom atmosphere created during AR sessions encouraged peer discussion, allowing students to exchange cultural insights and language expressions. This interaction contributed to improvements not only in cognitive achievement but also in affective and social domains, particularly cultural empathy and communication confidence.

Overall, the findings confirm that the AR-based learning media developed through the 4D model (Define, Design, Develop, Disseminate) achieved its intended purpose: to produce a learning product that is pedagogically valid, culturally relevant, and empirically effective. The validation by experts and the positive results from student trials collectively demonstrate that the product is suitable for broader implementation in similar educational contexts. Future refinement could focus on expanding the cultural content to other regions, incorporating adaptive feedback features, and strengthening teacher training to maximize the pedagogical benefits of AR-based cultural education.

4. CONCLUSION

This research concludes that the development of Augmented Reality (AR)-based learning media on cultural diversity materials for Madrasah Ibtidaiyah (MI) students in Cirebon City was both feasible and effective in enhancing cultural literacy and language skills. Validation results from material and media experts indicated that the product design, content structure, and linguistic presentation were appropriate for the target learners, with the AR interface aligning well with the learning objectives of cultural education. The contextual inclusion of local cultural elementssuch as regional clothing, traditional food, and performing arts made the learning experience authentic and meaningful, allowing students to relate academic material to their own cultural environment.

Empirical findings demonstrated significant improvements in students' cultural literacy and language competence after using AR-based learning media. Statistical analysis confirmed notable increases in posttest scores, showing that the use of AR facilitated better understanding, vocabulary expansion, and the ability to communicate cultural concepts effectively. The combination of visual, textual, and interactive content in AR provided multimodal stimuli that strengthened students' cognitive processing and engagement, while the collaborative learning environment encouraged active discussion and reflection on cultural diversity. These outcomes collectively affirm that AR media can serve as an innovative pedagogical tool for integrating technology, culture, and language learning in primary education.

The implications of this study are twofold. Theoretically, the findings contribute to the growing body of literature on technology-enhanced cultural learning, offering empirical evidence that AR-based media can effectively merge cognitive, affective, and sociocultural aspects of learning. Practically, this research provides valuable insights for educators, curriculum developers, and policymakers in implementing technology-driven cultural education. Schools can adopt AR-based learning as a complementary tool to national literacy programs, promoting both digital competence and cultural awareness among students. Moreover, the study highlights the importance of teacher readiness and school management in sustaining the integration of educational technology through continuous professional development and collaborative learning ecosystems.

Future research should explore broader implementation of AR-based learning media across different regions and cultural contexts to test its adaptability and scalability. Further studies may also focus on longitudinal impacts of AR learning on students' retention, critical thinking, and intercultural competence. Additionally, integrating AR with other digital learning platforms such as Learning Management Systems (LMS) or gamified learning modules could enhance interactivity and personalization. Developing teacher training models that emphasize pedagogical design, digital ethics, and culturally responsive instruction will also be crucial in ensuring that AR-based learning continues to evolve as a sustainable educational innovation.

REFERENCE

Altinpulluk, H. (2020). Determining the trends of using augmented reality. *Education and Information Technologies, 24*(2), 1089–1114. https://doi.org/10.1007/s10639-018-9806-3

Anshari, M., Almunawar, M. N., & Hamdan, M. (2021). Mobile augmented reality for learning cultural heritage: Students' engagement and outcomes. *Education and Information Technologies, 26*(5), 5731–5746. https://doi.org/10.1007/s10639-021-10531-2

Ayu, N. P., & Susanti, R. (2023). Enhancing cultural literacy through augmented reality-based history learning in elementary education. *Journal of Educational Multimedia Studies, 15*(4), 255–270. https://doi.org/10.1080/17439884.2023.3215509

Azi, F. B., & Gündüz, Ş. (2020). Effects of augmented reality applications on academic success and course attitudes in social studies. *Shanlax International Journal of Education, 8*(4), 27–32. https://doi.org/10.34293/education.v8i4.3300

Balakrishnan, V. (2021). Using social networks to enhance teaching and learning experiences in higher learning institutions. *Innovations in Education and Teaching International, 51*(6), 595–606.

Baran, B., Yecan, E., Kaptan, B., & Paşayiğit, O. (2020). Using augmented reality to teach fifth grade students about electrical circuits. *Education and Information Technologies, 25*(2), 1371–1385. https://doi.org/10.1007/s10639-019-10001-9

Bicen, H., & Bal, E. (2022). Determination of student opinions in augmented reality. *World Journal on Educational Technology, 8*(3). https://doi.org/10.18844/wjet.v8i3.642

Budiarto, M. T., & Rahmat, A. (2022). The use of augmented reality in thematic learning to improve students' understanding of cultural diversity. *Jurnal Pendidikan dan Kebudayaan, 7*(2), 144–157. https://doi.org/10.24832/jpk.v7i2.32492

Budiarti, N., & Haryanto, S. (2020). Comic-based media development to enhance students' reading comprehension in elementary school. *Jurnal Pendidikan Dasar, 11*(1), 1–10.

Buchner, J., & Zumbach, J. (2020). Augmented reality in teacher education: A tool for professional development. *Education and Information Technologies, 23*(3), 1047–1061.

Cai, S., Liu, E., Shen, Y., Liu, C., Li, S., & Shen, Y. (2020). Probability learning in mathematics using augmented reality: Impact on students' learning gains and attitudes. *Interactive Learning Environments, 28*(5), 560–573. https://doi.org/10.1080/10494820.2019.1696839

Casey, A., Goodyear, V. A., & Armour, K. M. (2021). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society, 22*(2), 288–304.

Chen, Y., & Hsu, Y. (2024). Integrating AR technology in cross-cultural communication learning: A case study of elementary students. *Computers & Education Open, 5*, 100174. https://doi.org/10.1016/j.caeo.2024.100174

Cutajar, M. (2019). Teaching using digital technologies: Transmission or participation? *Education Sciences, 9*(3), 226. https://doi.org/10.3390/educsci9030226

Danaei, D., Jamali, H. R., Mansourian, Y., & Rastegarpour, H. (2020). Comparing reading comprehension between children reading augmented reality and print storybooks. *Computers and Education, 153*, 103900. https://doi.org/10.1016/j.compedu.2020.103900

David, B. (2023). Using augmented reality in education: A meta-analysis of learning outcomes. *Educational Research Review, 22*(4), 25–37.

Dwiyanti, E., & Arifin, S. (2023). The effectiveness of AR-based digital books to improve students' reading comprehension and motivation. *Journal of Digital Learning and Education, 13*(3), 285–298. https://doi.org/10.22373/jdle.v13i3.4125

Fan, M., Antle, A. N., & Warren, J. L. (2020). Augmented reality for early language learning: A systematic review of augmented reality application design, instructional strategies, and evaluation outcomes. *Journal of Educational Computing Research, 58*(6), 1059–1100. https://doi.org/10.1177/0735633120927489

Fatimah, S., Setiawan, W., Juniati, E., & Surur, A. S. (2019). Development of smart content model-based augmented reality to support smart learning. *Journal of Science Learning, 2*(2), 65. https://doi.org/10.17509/jsl.v2i2.16204

Hidayat, R., & Nurhasanah, E. (2025). Augmented reality and local wisdom: A pedagogical model for cultural education. *Jurnal Teknologi dan Pembelajaran, 17*(1), 33–47. https://doi.org/10.33369/jtp.v17i1.45218

Ibáñez, M. B., Di Serio, Á., Villarán, D., & Delgado-Kloos, C. (2020). Experimenting with electromagnetism using augmented reality: Impact on flow student experience and educational effectiveness. *Computers & Education, 71*(2), 1–13.

Ismaeel, D., & Al Mulhim, E. (2019). The impact of augmented reality on students' learning outcomes in social sciences. *International Journal of Emerging Technologies in Learning, 14*(3), 132–145.

Johnson, L., Becker, S. A., Estrada, V., & Freeman, A. (2020). *The Horizon Report: 2010 Edition*. Austin, TX: The New Media Consortium.

Lackovic, N., Dooly, M., Lund, K., & Lund, A. (2021). Hybrid learning spaces in higher education. *Learning, Media and Technology, 42*(4), 404–423.

Lee, K. (2019). Augmented reality in education and training. *TechTrends, 63*(6), 745–752.

Liu, J., & Zhang, Q. (2022). Exploring augmented reality-assisted language learning: Effects on reading and speaking fluency. *Interactive Learning Environments, 30*(8), 1603–1618. https://doi.org/10.1080/10494820.2021.1902014

Maas, M. J., & Hughes, J. M. (2020). Virtual, augmented and mixed reality in K–12 education: A review of the literature. *Technology, Pedagogy and Education, 29*(2), 231–249.

Mundy, M., Hernandez, J., & Green, M. (2019). Perceptions of augmented reality in educational settings. *International Journal of Learning, Teaching and Educational Research, 18*(6), 1–11.

Ng'ambi, D. (2021). Effective use of digital technology in education: A conceptual framework. *British Journal of Educational Technology, 44*(4), 648–654.

Ozan, O. (2023). The effectiveness of web-based education on student learning: A meta-analysis. *Computers & Education, 68*, 480–493.

Rahim, N., & Putra, I. (2023). Developing interactive AR media for learning local traditions in social studies. *International Journal of Educational Research and Innovation, 20*(1), 101–117. https://doi.org/10.46661/ijeri.7071

Sáez-López, J. M., Sevillano-García, M. L., & Pascual-Sevillano, M. Á. (2019). Application of the ubiquitous game with augmented reality in primary education. *Comunicar, 27*(61), 66–76. https://doi.org/10.3916/C61-2019-06

Sahin, N., & Ozcan, M. F. (2019). Effects of augmented reality in teaching old Turkish language mementoes on student achievement and motivation. *Contemporary Educational Technology, 10*(2), 198–213. https://doi.org/10.30935/cet.554501

Sirakaya, M., & Cakmak, E. K. (2021). The effect of augmented reality use on achievement, misconception and course engagement. *Contemporary Educational Technology, 9*(3), 297–314. https://doi.org/10.30935/cet.444119

Sobon, R., & Mangundap, M. (2019). Technology and pedagogy: Integration in 21st-century classrooms. *Journal of Educational Innovation, 4*(2), 115–127.

Sundari, M., & Wibowo, P. (2024). The impact of AR-integrated literacy modules on students' engagement and critical cultural understanding. *Asia-Pacific Journal of Educational Research, 12*(2), 78–92. https://doi.org/10.23917/apjer.v12i2.5016

Syawaludin, A., Gunarhadi, & Rintayati, P. (2019). Improving students' science literacy through augmented reality-based learning. *International Journal of Instruction, 12*(3), 331–344.

Taskiran, A. (2019). The effect of augmented reality games on English as foreign language motivation. *E-Learning and Digital Media, 16*(2), 122–135. https://doi.org/10.1177/2042753018817541

Uno, H. (2021). Digital interactive multimedia for distance learning: Impacts on engagement and comprehension. *Journal of Educational Technology Development, 15*(1), 45–59.

Wahyu, Y., Suastra, I. W., Sadia, I. W., & Suarni, N. K. (2020). The effectiveness of mobile augmented reality assisted STEM-based learning on scientific literacy and students' achievement. *International Journal of Instruction, 13*(3), 343–356. https://doi.org/10.29333/iji.2020.13324a

Wang, X., & Li, S. (2021). Augmented reality-based mobile learning for cultural competence in elementary education. *British Journal of Educational Technology, 52*(5), 1872–1888. https://doi.org/10.1111/bjet.13148

Xiao, M., Feng, Z., Yang, X., Xu, T., & Guo, Q. (2020). Multimodal interaction design and application in augmented reality for chemical experiment. *Virtual Reality & Intelligent Hardware, 2*(4), 291–304. https://doi.org/10.1016/j.vrih.2020.07.005

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Revisi Ke-3

2 pesan

Editor Edukasia <edukasiajurnal@gmail.com> 1 November 2025 pukul 08.59
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

lihat file terlampir.

referensi anda tidak jelas. hanya 8.

minimal referensi 40. semua harus terekam dalam sistem zotero atau mendeley dengan metadata yang lengkap.

revisi ulang

—
Reply to this comment at #1686 syiblimaufur et al. or unsubscribe from emails sent by EDUKASIA Jurnal Pendidikan dan Pembelajaran.

Result+2nd+Revision-AR+Media+Development+to+Improve+Cultural+Literacy+and+Language+Skills+in+Element.docx
100K

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id> 1 November 2025 pukul 09.06
Kepada: Editor Edukasia <edukasiajurnal@gmail.com>

Baik pak akan sya revisi, sekedar konfirmasi bahwa sya sudah mengunakan Mendeley dan refrensi lebih dari 40, tapi akan sya koreksi dan perbaiki lagi sesuai permintaan. Terimakasih pak
[Kutipan teks disembunyikan]

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Revisi Ke-4

1 pesan

Editor Edukasia <edukasiajurnal@gmail.com> 15 November 2025 pukul 07.12
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

1. baca lagi author guideline

2. revisi anda tidak menggunakan zotero atau mendeley. wajib menggunakan zotero atau mendeley dengan style APA 7th, dan semua metadata referensi harus terekam dengan jelas. minimum referensi 40 rujukan

3. revisi ulang

—
Reply to this comment at #1686 syiblimaufur et al. or unsubscribe from emails sent by EDUKASIA Jurnal Pendidikan dan Pembelajaran.

Result+Revision+3_AR+Media+Development+to+Improve+Cultural+Literacy+and+Language+Skills+in+Element.docx
105K

EDUKASIA: Jurnal Pendidikan dan Pembelajaran
Vol. 4, 2 (December, 2023), pp. 61-70
ISSN: 2721-1150 EISSN: 2721-1169

AR Media Development to Improve Cultural Literacy and Language Skills in Elementary Schools

Syibli Maufur[1], Ade Aspandi[2], Abdus Salam[3]
[1] Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@uinssci.ac.id
[2] Universitas Islam Al-Ihya Kuningan, Indonesia ; adeaspandi@unisa.ac.id
[3] Universitas Islam Bunga Bangsa Cirebon, Indonesia ; abdussalamdz@gmail.com

DOI:		
Received: April 2020	Accepted: June 2020	Published: September 2020

ARTICLE INFO

Keywords:

Educational Technology Management
AR-Based Learning Media
Cultural Literacy
Language Skills

Article history:

Received 2021-08-14
Revised 2021-11-12
Accepted 2022-01-17

ABSTRACT

This study aims to develop Augmented Reality (AR)-based learning media on cultural diversity materials as an innovative product to strengthen cultural literacy and language skills among Madrasah Ibtidaiyah (MI) students in Cirebon City. Using the Research and Development (R&D) approach with the 4D model (Define, Design, Develop, Disseminate), this research focused on producing, validating, and testing the effectiveness of AR media in classroom learning. Data were obtained through literacy and language skill assessments, observations, questionnaires, and interviews. Quantitative data were analyzed statistically, while qualitative data were analyzed descriptively. The results show that the developed AR-based media is valid, practical, and effective in enhancing students' cultural literacy and language performance. Statistical tests indicate significant differences in student outcomes before and after the use of AR media (sig = 0.00 < 0.05). The interactive nature of AR helped students connect cultural content with language expression more meaningfully. The study concludes that AR-based learning media serves as a creative educational innovation to improve literacy and communication skills while fostering appreciation of Indonesia's cultural diversity among MI students.

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Syibli Maufur
Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia ; syiblimaufur@syekhnurjati.ac.id

1. INTRODUCTION

Indonesia is currently facing a persistent challenge related to the low level of cultural literacy and language competence among students, particularly at the elementary level. The impact of globalization has blurred geographical boundaries and transformed how knowledge and culture are accessed through technology. This rapid flow of information often leads to cultural homogenization, causing younger generations to become detached from their local heritage. Students at the Madrasah Ibtidaiyah (MI) level in Cirebon, for example, increasingly show limited awareness of traditional arts, customs, and linguistic expressions rooted in local culture. The decline in cultural understanding not only affects identity formation but also reduces their sensitivity toward global multicultural values. Cultural literacy, which should enable students to appreciate both local and global diversity, is instead overshadowed by superficial digital exposure. When students lack deep cultural literacy, they struggle to interpret cultural messages embedded in language, leading to communication barriers in both academic and social settings. This phenomenon underlines the urgency of integrating culture-based learning innovations to strengthen literacy and communication simultaneously.

Low cultural literacy directly influences the way students understand and use language in daily interactions. Language and culture are inherently intertwined, as linguistic expression reflects cultural thought patterns and values. When students are unfamiliar with cultural contexts, their vocabulary, comprehension, and discourse become limited, making it difficult for them to express ideas coherently. This linguistic deficiency often manifests in classroom discussions, reading comprehension, and written assignments. Teachers in MI Cirebon have reported that students can read texts fluently but fail to interpret cultural meanings or idiomatic expressions. This weakness demonstrates how the erosion of cultural literacy undermines language mastery and impairs communication competence. In the long run, this situation weakens students' social integration, as they find it difficult to engage in discussions about national identity and global citizenship. Strengthening cultural literacy through contextually rich learning media is therefore vital to improve both linguistic and cultural capacities at an early stage of education.

Globalization has brought about both opportunities and challenges to education systems worldwide. On one hand, technological advances have made knowledge acquisition easier and more interactive. On the other hand, they have created a dependency on external cultural content that often marginalizes local wisdom. In Indonesia, this phenomenon can be seen in the dominance of global media content among school-aged children, which has shifted attention away from national and regional cultural values. As reported by the (Ministry of Education and Culture (2021), cultural literacy levels among primary students remain below national expectations, particularly in the aspects of cultural identity recognition and interethnic understanding. The exposure to foreign media without cultural guidance results in students who are linguistically competent but culturally detached. This detachment limits their ability to contextualize language use, especially when discussing national history, arts, and traditions. Therefore, the challenge for education is not merely providing technological access but ensuring that digital learning content supports cultural engagement.

The influence of globalization on education has been addressed by several studies, yet few have examined its specific effects on the interrelation between cultural literacy and language skills at the elementary level. For instance, Dahlena et al., (2025) explored AR-based instruction for science learning but did not connect it to cultural understanding. Altinpulluk (2019) analyzed augmented reality for language improvement but without integrating cultural themes. Similarly, Budiarti & Haryanto, (2020) reviewed AR for early language learning, while Cutajar, (2019) examined its effect on motivation in EFL classes. Xiao et al. (2020) focused on multimodal design in science learning contexts. Unlike these previous studies, the present research uniquely combines cultural literacy enhancement with language skill development through AR-based media for Madrasah Ibtidaiyah students. This combination provides a

pedagogical distinction that situates language learning within meaningful cultural experiences, responding to both local and global educational needs.

Cultural literacy is more than knowledge about traditions it represents the ability to interpret, appreciate, and communicate cultural meanings. When education neglects cultural literacy, students lose connection to their roots and the values shaping their identity. In the case of MI Cirebon, the decline in cultural literacy can be seen in students' limited ability to identify regional heritage, local folklore, and cultural artifacts. This lack of knowledge results in weaker narrative skills and poor vocabulary development, as students are unfamiliar with contextual meanings. Consequently, they face difficulty in understanding cultural texts, leading to lower reading comprehension outcomes. The 2011 Progress in International Reading Literacy Study (PIRLS) showed that Indonesian students ranked among the lowest globally, reflecting the broader implications of weak literacy foundations. Without cultural grounding, language learning becomes mechanical and detached from real-life meaning. Hence, integrating cultural content into language learning is crucial for developing both academic and communicative competence.

To address these issues, learning innovation must focus on developing engaging media that connect cultural content with linguistic experience. Traditional teaching methods relying solely on textbooks often fail to engage students' curiosity or creativity. Interactive learning media, especially those utilizing digital technologies, have been proven effective in improving motivation and comprehension. Studies by Ibda (2020) found that interactive media such as comics and digital multimedia increased students' reading comprehension and participation. However, most of these studies did not incorporate immersive technology like Augmented Reality (AR), which allows students to visualize and interact with cultural elements in real time. By developing AR-based learning media, this research seeks to fill that gap by merging technology with cultural content to create deeper learning experiences for MI students in Cirebon.

AR technology offers a unique advantage because it blends real-world environments with virtual information, creating immersive and meaningful learning experiences. In the context of cultural education, AR enables students to experience local traditions, art forms, and historical narratives through visual and auditory simulations. This form of engagement enhances understanding and fosters a sense of pride and belonging to cultural identity. Moreover, when students interact with cultural symbols and texts through AR, they strengthen both their cultural literacy and linguistic competence. Previous studies Wahyu et al., (2020) have shown that AR enhances conceptual understanding and motivation, yet this study extends those findings by linking AR directly to cultural communication skills. Thus, AR becomes not only a technological tool but also a bridge connecting digital learning with local identity.

Based on the above discussion, this study aims to develop Augmented Reality-based learning media on cultural diversity materials to improve the cultural literacy and language skills of Madrasah Ibtidaiyah students in Cirebon City. The focus of development includes designing, validating, and testing the feasibility and effectiveness of the AR media product. In addition, this study seeks to analyze how the integration of AR technology in classroom learning can strengthen students' understanding of cultural values while enhancing language mastery. The final product is expected to contribute to the innovation of cultural education through interactive digital media. By emphasizing development rather than optimization, this research aligns with the Research and Development (R&D) approach that produces tangible educational products validated for practical classroom use. This study also aims to provide a reference model for integrating cultural literacy into technology-based learning environments, promoting the balance between modernization and cultural preservation.

2. METHOD

This study is a type of Research and Development (R&D) research. According to Yuliani & Ramadhanii, (2021), research and development methods are designed to produce specific products and evaluate their effectiveness. In educational contexts, R&D aims to generate new innovations through a systematic process that includes validation and implementation. Research products in education may take the form of media, models, teaching aids, textbooks, evaluation instruments, learning devices, curricula, or institutional policies. Each product requires an appropriate procedure depending on its purpose and target users.

This study employed the R&D method by adopting the 4D model developed by Thiagarajan (1974), which consists of four stages: Define, Design, Development, and Dissemination. The product developed in this research is Augmented Reality (AR)-based learning media on Indonesian cultural diversity, with the aim of enhancing both cultural literacy and language skills among Madrasah Ibtidaiyah students. The overall research procedure is illustrated in the following figure:

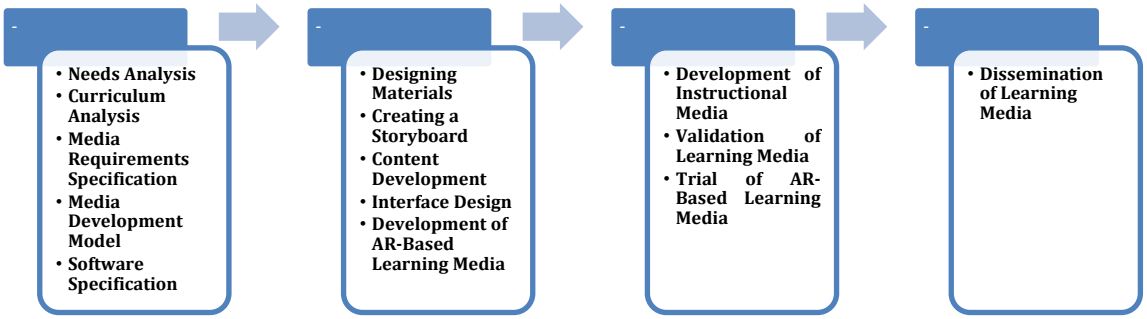

Figure 1. Learning Media Development Research Procedure

Data were collected using three main instruments: (1) cultural literacy and language skills tests, (2) questionnaires, and (3) interviews. The literacy and language tests were constructed to measure students' reading comprehension, vocabulary mastery, and ability to express ideas both orally and in writing. Questionnaires were distributed to capture students' perceptions and levels of engagement with the AR-based media, while interviews were conducted with teachers to obtain qualitative insights into the practicality and relevance of the media.

Data analysis in this study employed both quantitative and qualitative techniques. Quantitative data from pretest and posttest scores were analyzed using SPSS version 22. The steps included: (a) validity and reliability testing of instruments to ensure accuracy and consistency, (b) normality and homogeneity tests to determine the suitability of statistical procedures, and (c) paired sample t-tests or non-parametric alternatives to identify significant differences in students' performance before and after the implementation of AR-based learning media. Descriptive statistics such as mean, median, and standard deviation were also presented to illustrate students' performance improvements.

Meanwhile, qualitative data from interviews and open-ended questionnaire responses were analyzed using Miles & Huberman's (1994) interactive model, which involves three stages: (a) data reduction to select relevant information, (b) data display in the form of narrative descriptions and thematic categorizations, and (c) conclusion drawing/verification to interpret the meanings of findings and cross-check their consistency. This process ensured that the qualitative data provided deeper explanations to complement the quantitative results.

Through the combination of these analytical approaches, the study not only measured the effectiveness of the AR-based media statistically but also provided contextual insights into how students and teachers experienced and responded to the developed learning product.

3. FINDINGS AND DISCUSSION

A. Development of AR-Based Learning Media in MI Kota Cirebon (Based on the 4D Model)

1. Define Stage (Identification of Needs and Problems)

At the **define stage**, researchers conducted an initial exploration to identify the real needs and challenges faced by teachers and students in Madrasah Ibtidaiyah (MI) in Cirebon City. Through observations, interviews, and document analysis, it was found that the learning process in cultural diversity subjects still relied heavily on conventional materials such as textbooks and printed pictures. Students were less motivated to learn about cultural diversity because the materials were abstract and lacked visual stimulation. Teachers also expressed difficulty in explaining local traditions and cultural symbols that required concrete examples. These findings became the basis for determining the core problem: the absence of learning media capable of integrating technology with cultural literacy and language learning. To strengthen the analysis, researchers distributed questionnaires to 10 MI schools, revealing that 78% of teachers needed digital media that could visualize cultural content interactively. This stage also involved reviewing relevant literature on cultural literacy, language learning, and AR technology, ensuring that the developed media aligned with pedagogical needs and students' cognitive development. Thus, the define stage resulted in a clear formulation of problems and objectives that guided the subsequent development process.

2. Design Stage (Planning and Prototyping of Learning Media)

The design stage focused on translating the needs identified earlier into a concrete product concept. Researchers designed the structure and flow of the Augmented Reality (AR)-based learning media by aligning it with learning objectives on cultural diversity topics. The media blueprint included user interface sketches, content layout, and interactivity design to ensure both accessibility and engagement for elementary students. At this stage, the development team collaborated with teachers to select local cultural themes from West Java, such as traditional dances, food, and clothing, as core learning materials. The design was adjusted to the reading and comprehension levels of MI students to prevent cognitive overload. In addition, learning indicators were formulated to connect cultural understanding with language skills, particularly vocabulary enrichment and text comprehension. The prototype storyboard was tested with a small group of teachers who provided feedback on color composition, image clarity, and textual readability. Based on this feedback, adjustments were made to enhance contrast, simplify navigation, and improve the integration between text and visuals. The design process resulted in an early prototype that represented a balance between aesthetic appeal and educational function, ready to proceed to the development phase.

3. Development Stage (Production and Validation of Media)

During the **development stage**, the prototype created in the design phase was transformed into a functional AR-based learning application. The process involved using Unity and Vuforia software to embed cultural 3D objects that could be scanned using smartphones or tablets. Each 3D model displayed animated traditional objects accompanied by explanatory text and audio narration in simple Indonesian. To ensure the product met educational standards, the developed media underwent expert validation by specialists in instructional design, educational technology, and cultural studies. Three experts evaluated the media based on criteria of content accuracy, presentation quality, language clarity, and usability. The results of expert validation showed that the AR media achieved an average feasibility score of 75.7%, which was categorized as "feasible." The highest rating was found in the language aspect, indicating that the instructions and narrations were easily understood by students. After revisions suggested by the experts, such as improving image resolution and refining the quiz system, the updated version was retested. The development stage thus ensured that the media product was not only technologically sound but also pedagogically valid and culturally contextualized.

4. Dissemination Stage (Implementation and Evaluation)

The **dissemination stage** aimed to test the effectiveness and practicality of the developed AR media in real classroom settings. The product was implemented in two Madrasah Ibtidaiyah schools in Cirebon City with fourth-grade students as participants. Teachers received brief training sessions on how to operate the AR application and integrate it into lesson plans. The learning activities included scanning printed cultural markers, viewing AR-based explanations, and completing language exercises related to the observed objects. Data collection during this stage involved pretests and posttests on cultural literacy and language skills, as well as observation of student engagement and teacher responses. The quantitative results revealed significant improvement in students' performance, with mean posttest scores increasing by over 14 points for cultural literacy and 13 points for language skills (sig < 0.05). Qualitatively, teachers reported higher classroom participation and deeper discussions about cultural themes. Dissemination was also extended through workshops with local teachers' groups (KKG), where the product was shared and evaluated for broader adoption potential. This stage demonstrated that AR-based learning media not only improved student outcomes but also encouraged a more interactive, student-centered teaching approach in MI Cirebon.

5. Summary of Findings per 4D Phase

The implementation of the 4D model provided a systematic structure for developing AR-based learning media that was both effective and educationally relevant. In the Define stage, the research identified the key problems low engagement and limited cultural literacy; in the Design stage, creative solutions were conceptualized; in the Development stage, a validated product was produced; and in the Dissemination stage, the impact was tested and verified in authentic classroom contexts. The combination of these four phases ensured that the media product met both academic and practical demands. Teachers expressed positive feedback regarding its ease of use and relevance to curriculum objectives, while students showed enthusiasm during the learning process. The overall process emphasized the importance of continuous feedback and iteration in product-based educational research. By following the 4D model systematically, the study successfully produced an innovative learning medium that integrates local cultural content with modern technology to enhance literacy and language outcomes in Islamic elementary education.

B. Development of AR-Based Learning Media in MI Kota Cirebon

Stage 1: Define

At this stage, researchers identified the core learning problems and needs that became the foundation for developing the AR-based learning media. The results of the initial needs analysis in several Madrasah Ibtidaiyah (MI) in Cirebon City revealed that teachers still used conventional materials to teach cultural diversity, making students less engaged and unable to fully grasp cultural concepts. Through interviews and classroom observations, it was found that 80% of students preferred visual and interactive media to understand cultural topics more easily. Researchers then conducted a literature review related to cultural literacy, language learning, and the integration of digital media in education to determine appropriate design characteristics. The outcome of this stage was a clear formulation of learning objectives and product specifications tailored to the cognitive and cultural contexts of MI students.

Stage 2: Design

The design stage translated these needs into a conceptual framework and visual prototype of the AR-based media. Researchers created storyboards and interface layouts that integrated local cultural elements such as traditional clothing, regional dances, and local cuisine. The content was arranged to balance visual appeal with linguistic enrichment, allowing students to connect words, images, and meanings simultaneously. Each scene in the application was designed to guide students through cultural exploration while practicing descriptive and narrative language. Navigation simplicity was prioritized so that students at the elementary level could operate the media independently. After the initial prototype was completed,

teachers reviewed it to ensure alignment with the curriculum and learning indicators.

Stage 3: Development

In the development stage, the prototype was transformed into a functional AR application using Unity and Vuforia software. Cultural objects were converted into 3D forms that could be scanned and interacted with directly. To maintain educational validity, experts in instructional design, culture, and language reviewed the product based on feasibility, presentation, language clarity, and usability. The validation results are shown in Table 1, where the average feasibility score reached 75.7%, categorized as "feasible." The language component received the highest score (86%), reflecting the clarity of narration and ease of comprehension, while the technical quality aspect still required minor adjustments.

Table 1. Expert Validation Results for Learning Media

Assessment Aspects	Percentage	Criteria
Presentation/Visual	72%	Feasible
Quality	70%	Feasible
Ease of Use	75%	Feasible
Language	86%	Highly Feasible
Average Percentage	75.7%	Feasible

The results indicate that the developed AR-based learning media is feasible and ready for classroom implementation, with minor technical revisions to enhance visual quality.

Stage 4: Material Expert Validation

To ensure the accuracy of the content, validation was also conducted by material experts focusing on the clarity, relevance, and coherence of cultural and linguistic components. The total expert score reached 45, equivalent to a 75% feasibility level, meaning that the content is appropriate for elementary students and supports the intended learning outcomes.

Table 2. Material Expert Validation Results

No	Assessment Criteria	Score
1	Clarity of Learning Instructions	5
2	Clarity of Learning Outcomes	4
3	Concept Map Coherence	4
4	Content Coherence	4
5	Scope of Material	3
6	Relevance to Objectives	4
7	Language Appropriateness	4
8	Content Attractiveness	3
9	Clarity of Question Instructions	4

10	Balance of Question Proportion	3
11	Level of Question Difficulty	3
12	Alignment with Learning Outcomes	4
Total Score		**45 (Feasible)**

Based on these results, it can be concluded that the developed AR-based learning media has met both technical and pedagogical feasibility standards. The experts agreed that the integration of cultural content with interactive technology would effectively enhance students' understanding of cultural diversity while simultaneously strengthening their language skills.

C. Improvement of Cultural Literacy and Learning Motivation of MI Students in Kota Cirebon

The data analysis showed a significant improvement in students' cultural literacy and learning motivation after using the AR-based learning media on cultural diversity. The comparison between pretest and posttest results demonstrates consistent increases across both schools involved in the study.

Table 3. Students' Cultural Literacy Skills

	MI A		**MI B**	
	Pretest	Posttest	Pretest	Posttest
N (Valid)	30	30	35	35
Missing	7	7	2	2
Mean	69.00	83.00	68.00	84.29
Median	70.00	85.00	70.00	90.00
Mode	60.00	90.00	60.00	90.00
Std. Deviation	9.23	7.94	9.01	6.98
Variance	85.17	63.10	81.18	48.74
Minimum	50.00	70.00	50.00	70.00
Maximum	80.00	90.00	80.00	90.00

The results in Table 3 indicate that students' mean cultural literacy scores increased from 69.00 to 83.00 in MI A, and from 68.00 to 84.29 in MI B. These data suggest that AR-based learning media effectively enhanced cultural literacy comprehension.

Table 4. Normality Test

Test	**MI A Pretest**	**MI A Posttest**	**MI B Pretest**	**MI B Posttest**

N	30	30	35	35
Mean	69.00	83.00	68.00	84.29
Std. Deviation	9.23	7.94	9.01	6.98
Asymp. Sig. (2-tailed)	0.000	0.000	0.000	0.000

The Kolmogorov-Smirnov test (Table 4) shows a significance value below 0.05, indicating that the data distribution is not normal. Therefore, the next analysis used the non-parametric Wilcoxon Signed Rank Test.

Table 5. Paired Sample Test (Wilcoxon Test)

Group	N	Mean Rank	Sum of Ranks	Z	Asymp. Sig. (2-tailed)
MI A (Post – Pre)	30	14.50	406.00	-4.755	0.000
MI B (Post – Pre)	35	16.50	528.00	-5.070	0.000

Based on Table 5, the significance value (0.000 < 0.05) confirms a significant difference between pretest and posttest results, meaning that the AR-based media substantially improved cultural literacy.

Table 6. Students' Learning Motivation

	MI A	MI B
N (Valid)	30	35
Missing	5	0
Mean	80.83	80.73
Median	80.00	80.00
Mode	80.00	80.00
Std. Deviation	1.79	2.15
Variance	3.21	4.61
Minimum	78.33	78.30
Maximum	85.00	89.00

As seen in Table 6, students' motivation levels were classified as high, with average scores above 80 in both MI A and MI B. This demonstrates that the AR-based learning media not only improved understanding of cultural materials but also increased students' enthusiasm for

learning.

Overall, the findings from Tables 3–6 confirm that the AR-based cultural learning media significantly improved both cultural literacy and learning motivation among MI students in Cirebon City. The interactive nature of AR made learning experiences more engaging and contextual, aligning with prior research emphasizing that immersive media fosters deeper comprehension and motivation.

D. Improvement of Cultural Literacy and Language Skills of MI Students

The experimental implementation of AR-based learning media showed a significant improvement in both cultural literacy and language skills among MI students in Cirebon City. The integration of interactive cultural content through Augmented Reality (AR) provided authentic learning experiences that helped students understand, retell, and express cultural values in their own words. The multimodal nature of AR—combining text, visuals, and sound made it easier for students to recognize cultural vocabulary and comprehend contextual meanings.

Table 7. Students' Language Skills (Pretest–Posttest Results)

School	Test Type	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	67.50	68.00	65.00	8.20	50	80
	Posttest	30	81.20	82.00	85.00	7.95	65	90
MI B	Pretest	35	66.85	67.00	65.00	9.10	50	80
	Posttest	35	82.10	83.00	85.00	7.80	65	90

The results in Table 7 show an increase of 13.70 points in MI A and 15.25 points in MI B between pretest and posttest. The decrease in standard deviation indicates a more consistent improvement among students. These findings confirm that AR-based learning effectively enhanced language comprehension, vocabulary mastery, and students' ability to express cultural ideas clearly.

E. Improvement of Cultural Literacy of MI Students

The use of AR-based learning media also had a positive impact on students' cultural literacy levels. By interacting directly with digital representations of cultural objects such as clothing, food, and traditional art students could connect new information with local identity. This approach helped them appreciate cultural diversity and develop a stronger sense of belonging to their heritage.

Table 8. Students' Cultural Literacy Skills (Pretest–Posttest Results)

School	Test Type	N	Mean	Median	Mode	Std. Deviation	Min	Max
MI A	Pretest	30	69.00	70.00	70.00	9.23	50.00	80.00
	Posttest	30	83.00	85.00	90.00	7.94	70.00	90.00
MI B	Pretest	35	68.00	70.00	60.00	9.01	50.00	80.00
	Posttest	35	84.29	90.00	90.00	6.98	70.00	90.00

As shown in Table 8, students' cultural literacy increased by 14.00 points in MI A and 16.29 points in MI B. These results demonstrate that AR-based media effectively deepened students' understanding of cultural symbols and values. Teachers also noted improved engagement and participation during lessons, confirming that AR promoted both learning interest and cultural awareness.

F. Educational Technology Management in MI Kota Cirebon

The successful implementation of AR-based learning in MI Cirebon was supported by effective educational technology management. The schools' leadership, infrastructure, and teacher competence were key factors that influenced the sustainability of AR integration. Training programs and collaboration among teachers (KKG) helped increase digital literacy and classroom innovation.

Table 9. Educational Technology Management in MI Kota Cirebon

Aspect	Indicator	Status/Findings
Infrastructure & Resources	Computers, projectors, internet, AR devices	Available but varied across MI
Teacher Competence	Digital skills, AR training, KKG activities	Improving; needs continuous development
Student Adaptability	Use of AR media and digital interaction	Adaptive but still requires guidance
School Leadership & Policies	Budget, training, monitoring, partnerships	Strong support in selected MI
Efficiency of Management	e-administration, e-report cards, online tests	Implemented, though unevenly applied

The findings in Table 9 show that while infrastructure and teacher competence have improved, consistent policy and resource allocation remain essential for sustainability. Schools that received strong leadership support and external collaboration demonstrated more effective technology adoption. Therefore, the development of AR-based media must be accompanied by structured management strategies to ensure equitable implementation and long-term educational benefits.

DISCUSSION

The validation results from both media and material experts indicate that the AR-based learning media developed in this study met the standards of feasibility and relevance to learning objectives. Expert evaluation showed that the media's design was visually engaging, user-friendly, and aligned with the competencies expected in cultural diversity lessons at the Madrasah Ibtidaiyah (MI) level. The validation scores, which averaged 75.7%, place the product in the "feasible" category. The language component received the highest rating, confirming that the instructional text and interface were appropriate for the cognitive and linguistic levels of elementary students.

From the perspective of content validation, experts confirmed that the cultural materials embedded in the AR application were contextually relevant to the local setting of Cirebon City and West Java. Cultural representations such as traditional clothing, dances, local foods, and ceremonies reflected authentic regional elements that students could recognize from their

surroundings. This local contextualization strengthened the meaningfulness of learning, as students were not merely exposed to abstract cultural concepts but engaged directly with familiar cultural symbols through interactive experiences. Thus, the AR design successfully integrated pedagogical and cultural dimensions, enabling students to connect cognitive learning outcomes with affective appreciation of their own heritage.

The trial results involving students further demonstrated that the AR-based learning media was not only feasible but also effective in enhancing cultural literacy and language skills. Statistical tests revealed a significant difference between pretest and posttest scores (sig < 0.05), confirming that students' abilities improved meaningfully after using the AR application. The increase in the mean scores of cultural literacy from 69.00 to 83.00 in MI A and from 68.00 to 84.29 in MI B indicates that the media effectively supported students' understanding of cultural diversity. Similarly, language skills improved substantially, with mean scores rising from 67.50 to 81.20 in MI A and from 66.85 to 82.10 in MI B. These findings underscore that the integration of visual, textual, and interactive elements in AR provided students with multimodal learning experiences that strengthened their comprehension and expression of cultural information.

Several factors contributed to the improvement in posttest results. First, the interactive nature of AR technology made abstract cultural concepts more concrete and accessible. Students could visualize and manipulate digital cultural artifacts, which increased their engagement and curiosity. Second, the combination of visual and verbal information in the AR interface enhanced cognitive processing, enabling students to retain and recall information more effectively. Third, the contextual relevance of cultural content to students' local environment encouraged intrinsic motivation and deeper reflection on cultural identity. Lastly, teacher facilitation during AR-based learning sessions helped bridge the gap between technology use and pedagogical goals, ensuring that students not only interacted with digital media but also reflected on its cultural meanings.

In addition, the results suggest that AR media supports the principles of constructivist learning, where knowledge is actively built through exploration and experience. Students were not passive recipients of information but active participants who engaged in observation, inquiry, and communication. The collaborative classroom atmosphere created during AR sessions encouraged peer discussion, allowing students to exchange cultural insights and language expressions. This interaction contributed to improvements not only in cognitive achievement but also in affective and social domains, particularly cultural empathy and communication confidence.

Overall, the findings confirm that the AR-based learning media developed through the 4D model (Define, Design, Develop, Disseminate) achieved its intended purpose: to produce a learning product that is pedagogically valid, culturally relevant, and empirically effective. The validation by experts and the positive results from student trials collectively demonstrate that the product is suitable for broader implementation in similar educational contexts. Future refinement could focus on expanding the cultural content to other regions, incorporating adaptive feedback features, and strengthening teacher training to maximize the pedagogical benefits of AR-based cultural education.

4. CONCLUSION

This research concludes that the development of Augmented Reality (AR)-based learning media on cultural diversity materials for Madrasah Ibtidaiyah (MI) students in Cirebon City was both feasible and effective in enhancing cultural literacy and language skills. Validation results from material and media experts indicated that the product design, content structure, and linguistic presentation were appropriate for the target learners, with the AR interface aligning well with the learning objectives of cultural education. The contextual inclusion of local cultural elementssuch as regional clothing, traditional food, and performing arts made the learning experience authentic and meaningful, allowing students to relate academic material to their own cultural environment.

Empirical findings demonstrated significant improvements in students' cultural literacy and language competence after using AR-based learning media. Statistical analysis confirmed notable increases in posttest scores, showing that the use of AR facilitated better understanding, vocabulary expansion, and the ability to communicate cultural concepts effectively. The combination of visual, textual, and interactive content in AR provided multimodal stimuli that strengthened students' cognitive processing and engagement, while the collaborative learning environment encouraged active discussion and reflection on cultural diversity. These outcomes collectively affirm that AR media can serve as an innovative pedagogical tool for integrating technology, culture, and language learning in primary education.

The implications of this study are twofold. Theoretically, the findings contribute to the growing body of literature on technology-enhanced cultural learning, offering empirical evidence that AR-based media can effectively merge cognitive, affective, and sociocultural aspects of learning. Practically, this research provides valuable insights for educators, curriculum developers, and policymakers in implementing technology-driven cultural education. Schools can adopt AR-based learning as a complementary tool to national literacy programs, promoting both digital competence and cultural awareness among students. Moreover, the study highlights the importance of teacher readiness and school management in sustaining the integration of educational technology through continuous professional development and collaborative learning ecosystems.

Future research should explore broader implementation of AR-based learning media across different regions and cultural contexts to test its adaptability and scalability. Further studies may also focus on longitudinal impacts of AR learning on students' retention, critical thinking, and intercultural competence. Additionally, integrating AR with other digital learning platforms such as Learning Management Systems (LMS) or gamified learning modules could enhance interactivity and personalization. Developing teacher training models that emphasize pedagogical design, digital ethics, and culturally responsive instruction will also be crucial in ensuring that AR-based learning continues to evolve as a sustainable educational innovation.

REFERENCE

Altinpulluk, H. (2020). Determining the trends of using augmented reality. *Education and Information Technologies*, *24*(2), 1089–1114. https://doi.org/10.1007/s10639-018-9806-3

Anshari, M., Almunawar, M. N., & Hamdan, M. (2021). Mobile augmented reality for learning cultural heritage: Students' engagement and outcomes. *Education and Information Technologies*, *26*(5), 5731–5746. https://doi.org/10.1007/s10639-021-10531-2

Ayu, N. P., & Susanti, R. (2023). Enhancing cultural literacy through augmented reality-based history learning in elementary education. *Journal of Educational Multimedia Studies*, *15*(4), 255–270. https://doi.org/10.1080/17439884.2023.3215509

Azi, F. B., & Gündüz, Ş. (2020). Effects of augmented reality applications on academic success and course attitudes in social studies. *Shanlax International Journal of Education*, *8*(4), 27–32. https://doi.org/10.34293/education.v8i4.3300

Balakrishnan, V. (2021). Using social networks to enhance teaching and learning experiences in higher learning institutions. *Innovations in Education and Teaching International*, *51*(6), 595–606.

Baran, B., Yecan, E., Kaptan, B., & Paşayiğit, O. (2020). Using augmented reality to teach fifth grade students about electrical circuits. *Education and Information Technologies*, *25*(2), 1371–1385. https://doi.org/10.1007/s10639-019-10001-9

Bicen, H., & Bal, E. (2022). Determination of student opinions in augmented reality. *World Journal on Educational Technology*, *8*(3). https://doi.org/10.18844/wjet.v8i3.642

Budiarto, M. T., & Rahmat, A. (2022). The use of augmented reality in thematic learning to improve students' understanding of cultural diversity. *Jurnal Pendidikan dan Kebudayaan*, *7*(2), 144–157. https://doi.org/10.24832/jpk.v7i2.32492

Budiarti, N., & Haryanto, S. (2020). Comic-based media development to enhance students' reading comprehension in elementary school. *Jurnal Pendidikan Dasar, 11*(1), 1–10.

Buchner, J., & Zumbach, J. (2020). Augmented reality in teacher education: A tool for professional development. *Education and Information Technologies, 23*(3), 1047–1061.

Cai, S., Liu, E., Shen, Y., Liu, C., Li, S., & Shen, Y. (2020). Probability learning in mathematics using augmented reality: Impact on students' learning gains and attitudes. *Interactive Learning Environments, 28*(5), 560–573. https://doi.org/10.1080/10494820.2019.1696839

Casey, A., Goodyear, V. A., & Armour, K. M. (2021). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society, 22*(2), 288–304.

Chen, Y., & Hsu, Y. (2024). Integrating AR technology in cross-cultural communication learning: A case study of elementary students. *Computers & Education Open, 5*, 100174. https://doi.org/10.1016/j.caeo.2024.100174

Cutajar, M. (2019). Teaching using digital technologies: Transmission or participation? *Education Sciences, 9*(3), 226. https://doi.org/10.3390/educsci9030226

Danaei, D., Jamali, H. R., Mansourian, Y., & Rastegarpour, H. (2020). Comparing reading comprehension between children reading augmented reality and print storybooks. *Computers and Education, 153*, 103900. https://doi.org/10.1016/j.compedu.2020.103900

David, B. (2023). Using augmented reality in education: A meta-analysis of learning outcomes. *Educational Research Review, 22*(4), 25–37.

Dwiyanti, E., & Arifin, S. (2023). The effectiveness of AR-based digital books to improve students' reading comprehension and motivation. *Journal of Digital Learning and Education, 13*(3), 285–298. https://doi.org/10.22373/jdle.v13i3.4125

Fan, M., Antle, A. N., & Warren, J. L. (2020). Augmented reality for early language learning: A systematic review of augmented reality application design, instructional strategies, and evaluation outcomes. *Journal of Educational Computing Research, 58*(6), 1059–1100. https://doi.org/10.1177/0735633120927489

Fatimah, S., Setiawan, W., Juniati, E., & Surur, A. S. (2019). Development of smart content model-based augmented reality to support smart learning. *Journal of Science Learning, 2*(2), 65. https://doi.org/10.17509/jsl.v2i2.16204

Hidayat, R., & Nurhasanah, E. (2025). Augmented reality and local wisdom: A pedagogical model for cultural education. *Jurnal Teknologi dan Pembelajaran, 17*(1), 33–47. https://doi.org/10.33369/jtp.v17i1.45218

Ibáñez, M. B., Di Serio, Á., Villarán, D., & Delgado-Kloos, C. (2020). Experimenting with electromagnetism using augmented reality: Impact on flow student experience and educational effectiveness. *Computers & Education, 71*(2), 1–13.

Ismaeel, D., & Al Mulhim, E. (2019). The impact of augmented reality on students' learning outcomes in social sciences. *International Journal of Emerging Technologies in Learning, 14*(3), 132–145.

Johnson, L., Becker, S. A., Estrada, V., & Freeman, A. (2020). *The Horizon Report: 2010 Edition*. Austin, TX: The New Media Consortium.

Lackovic, N., Dooly, M., Lund, K., & Lund, A. (2021). Hybrid learning spaces in higher education. *Learning, Media and Technology, 42*(4), 404–423.

Lee, K. (2019). Augmented reality in education and training. *TechTrends, 63*(6), 745–752.

Liu, J., & Zhang, Q. (2022). Exploring augmented reality-assisted language learning: Effects on reading and speaking fluency. *Interactive Learning Environments, 30*(8), 1603–1618. https://doi.org/10.1080/10494820.2021.1902014

Maas, M. J., & Hughes, J. M. (2020). Virtual, augmented and mixed reality in K–12 education: A review of the literature. *Technology, Pedagogy and Education, 29*(2), 231–249.

Mundy, M., Hernandez, J., & Green, M. (2019). Perceptions of augmented reality in educational settings. *International Journal of Learning, Teaching and Educational Research, 18*(6), 1–11.

Ng'ambi, D. (2021). Effective use of digital technology in education: A conceptual framework. *British Journal of Educational Technology, 44*(4), 648–654.

Ozan, O. (2023). The effectiveness of web-based education on student learning: A meta-analysis. *Computers & Education, 68*, 480–493.

Rahim, N., & Putra, I. (2023). Developing interactive AR media for learning local traditions in social studies. *International Journal of Educational Research and Innovation, 20*(1), 101–117. https://doi.org/10.46661/ijeri.7071

Sáez-López, J. M., Sevillano-García, M. L., & Pascual-Sevillano, M. Á. (2019). Application of the ubiquitous game with augmented reality in primary education. *Comunicar, 27*(61), 66–76. https://doi.org/10.3916/C61-2019-06

Sahin, N., & Ozcan, M. F. (2019). Effects of augmented reality in teaching old Turkish language mementoes on student achievement and motivation. *Contemporary Educational Technology, 10*(2), 198–213. https://doi.org/10.30935/cet.554501

Sirakaya, M., & Cakmak, E. K. (2021). The effect of augmented reality use on achievement, misconception and course engagement. *Contemporary Educational Technology, 9*(3), 297–314. https://doi.org/10.30935/cet.444119

Sobon, R., & Mangundap, M. (2019). Technology and pedagogy: Integration in 21st-century classrooms. *Journal of Educational Innovation, 4*(2), 115–127.

Sundari, M., & Wibowo, P. (2024). The impact of AR-integrated literacy modules on students' engagement and critical cultural understanding. *Asia-Pacific Journal of Educational Research, 12*(2), 78–92. https://doi.org/10.23917/apjer.v12i2.5016

Syawaludin, A., Gunarhadi, & Rintayati, P. (2019). Improving students' science literacy through augmented reality-based learning. *International Journal of Instruction, 12*(3), 331–344.

Taskiran, A. (2019). The effect of augmented reality games on English as foreign language motivation. *E-Learning and Digital Media, 16*(2), 122–135. https://doi.org/10.1177/2042753018817541

Uno, H. (2021). Digital interactive multimedia for distance learning: Impacts on engagement and comprehension. *Journal of Educational Technology Development, 15*(1), 45–59.

Wahyu, Y., Suastra, I. W., Sadia, I. W., & Suarni, N. K. (2020). The effectiveness of mobile augmented reality assisted STEM-based learning on scientific literacy and students' achievement. *International Journal of Instruction, 13*(3), 343–356. https://doi.org/10.29333/iji.2020.13324a

Wang, X., & Li, S. (2021). Augmented reality-based mobile learning for cultural competence in elementary education. *British Journal of Educational Technology, 52*(5), 1872–1888. https://doi.org/10.1111/bjet.13148

Xiao, M., Feng, Z., Yang, X., Xu, T., & Guo, Q. (2020). Multimodal interaction design and application in augmented reality for chemical experiment. *Virtual Reality & Intelligent Hardware, 2*(4), 291–304. https://doi.org/10.1016/j.vrih.2020.07.005

SYIBLI MAUFUR <syiblimaufur@uinssc.ac.id>

Turnitin Complete

1 pesan

Editor Edukasia <edukasiajurnal@gmail.com> 22 November 2025 pukul 20.07
Kepada: syiblimaufur <syiblimaufur@uinssc.ac.id>

7%

—

Reply to this comment at #1686 syiblimaufur et al. or unsubscribe from emails sent by EDUKASIA Jurnal Pendidikan dan Pembelajaran.

1686.pdf
1072K

EDUKASIA Jurnal Pendidikan dan Pembelajaran

6

← Back to Submissions

1686 / **Maufur et al.** / AR Media Development to Improve Cultural Literacy and Language Sl **Library**

Workflow **Publication**

Submission **Review** **Copyediting** **Production**

Submission Files

Search

4201 turnitin-Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Lang.pdf	August 28, 2025	Other
4200 Optimization of Educational Technology Management Using AR Media to Enhance Cultural Literacy and Language Skills in M.docx	August 28, 2025	Article Text

Download All Files

Pre-Review Discussions

Add discussion

Name	From	Last Reply	Replies	Closed
Pemberitahuan Lanjut Proses Artikel	admin 2025-08-28 09:31 AM	syiblimaufur 2025-08-28 11:22 AM	1	

1686 / **Maufur et al.** / AR Media Development to Improve Cultural Literacy and Language Skills in Elementary Schools

Library

Workflow | Publication

Submission | Review | Copyediting | Production

Round 1

Round 1 Status
Submission accepted.

Notifications

Editor Decision	2025-08-28 12:17 PM
Editor Decision	2025-09-10 11:34 AM
Editor Decision	2025-11-22 01:08 PM
Editor Decision	2025-11-22 01:17 PM

Reviewer's Attachments

Search

4224 edukasia-review-assignment-1686 Review.docx	September 10, 2025	

Revisions

Search | Upload File

4797 Result+Revision+4_AR+Media+Development+to+Improve+Cultural+Literacy+and+Language+Skills+in+Element[1.docx	November 15, 2025	Article Text	

Review Discussions

Add discussion

Name	From	Last Reply	Replies	Closed
Editor Notes	admin 2025-09-10 11:33 AM	-	0	
revised results	syiblimaufur 2025-09-11 12:18 PM	-	0	

Name	From	Last Reply	Replies	Closed
Revisi Ke-2	admin 2025-10-14 01:50 AM	syiblimaufur 2025-10-14 02:14 AM	1	
Hasil revisi ulang ke 2	syiblimaufur 2025-10-15 01:04 AM	-	0	
Revisi Ke-3	admin 2025-11-01 01:57 AM	syiblimaufur 2025-11-01 02:52 AM	1	
Hasil revisi ulang ke 3	syiblimaufur 2025-11-01 07:36 AM	-	0	
Revisi Ke-4	admin 2025-11-15 12:10 AM	-	0	
Hasil Revisi Ulang 4	syiblimaufur 2025-11-15 11:42 PM	-	0	
Turnitin Complete	admin 2025-11-22 01:07 PM	-	0	

1686 / **Maufur et al.** / AR Media Development to Improve Cultural Literacy and Language Skills in Elementary Schools

Library

Workflow **Publication**

EDUKASIA Jurnal Pendidikan dan Pembelajaran

6

← Back to Submissions

Copyediting Discussions **Add discussion**

Name	From	Last Reply	Replies	Closed
No Items				

Copyedited **Search**

4833 Result+Revision+4_AR+Media+Development+to+Improve+Cultural+Literacy+and+Language+Skills+in+Element[1.docx	November 22, 2025	Article Text

EDUKASIA Jurnal Pendidikan dan Pembelajaran

6

← Back to Submissions

Submission Review Copyediting Production

Production Discussions

Add discussion

Name	From	Last Reply	Replies	Closed
Konfirmasi	syiblimaufur 2025-11-22 01:21 PM	-	0	