Development Of Local Wisdom Based E-Comic Media For Cultural Literacy In Elementary School

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Abstract

This study aims to develop a local wisdom-based e-comic to improve the cultural literacy of fourth-grade students at SD Negeri 3 Bringin. The research employed the Research and Development (R&D) method using the 4D development model, consisting of Define, Design, Develop, and Disseminate stages. The study involved 25 students. Data were collected through expert validation questionnaires, teacher and student responses, and pretest and posttest assessments. The results showed that media expert validation reached 89.22% and material expert validation reached 90.22%, both categorized as highly feasible. The practicality scores were 90% from teachers and 92.67% from students. The effectiveness test showed a significance value of 0.001 and an N-Gain score of 0.7417. Therefore, the developed e-comic is valid, practical, and effective in improving students' cultural literacy.

Kata Kunci: e-komik; kearifan lokal; literasi budaya; media pembelajaran; sekolah dasar.

Abstrak

Penelitian ini bertujuan menghasilkan media e-komik berbasis kearifan lokal sebagai sarana untuk meningkatkan literasi budaya peserta didik kelas IV SD Negeri 3 Bringin. Penelitian ini menerapkan metode Research and Development (R&D) dengan model pengembangan 4D yang meliputi tahap Define, Design, Develop, dan Disseminate, dengan melibatkan 25 peserta didik sebagai subjek penelitian. Pengumpulan data dilakukan melalui lembar validasi ahli, angket respons guru dan peserta didik, serta tes awal dan tes akhir. Hasil penelitian menunjukkan bahwa media memperoleh validasi ahli media sebesar 89,22% dan ahli materi sebesar 90,22% dengan kategori sangat layak. Tingkat kepraktisan mencapai 90% berdasarkan respons guru dan 92,67% berdasarkan respons peserta didik. Hasil uji efektivitas memperoleh nilai signifikansi 0,001 dan N-Gain sebesar 0,7417. Berdasarkan hasil tersebut, media e-komik berbasis kearifan lokal dinyatakan valid, praktis, dan efektif untuk meningkatkan literasi budaya peserta didik.

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Introduction

Instructional media plays a pivotal role in the delivery of education, serving as a tool to convey information, concepts, and learning materials to students. Beyond facilitating the delivery of content, instructional media enhances the quality of interaction between educators and students, thereby fostering a learning environment that is more effective, active, and conducive to learning. With the appropriate use of media, students can more easily grasp the material and are motivated to engage optimally in the learning process. Instructional media holds a distinct place in the successful implementation of teaching and learning activities. This reinforces the view held by Afifah that instructional media encompasses the various forms and channels used to convey messages or information during the learning process.[1] Selecting the right media is a crucial factor in learning success, as it enhances the effectiveness of content delivery and helps students gain a deeper understanding of the concepts being studied. This is particularly relevant given that modern education increasingly focuses on developing 21st-century skills, such as critical thinking, creativity, collaboration, and communication. Hidayat et al. emphasize the importance of using digital technology in education to prepare students for global challenges.[2] In line with this, research by Maulana et al.[3] demonstrates that optimizing digital media within 21st-century instructional design offers an innovative approach that is more flexible, personalized, and inclusive.

In today's digital era, the use of instructional media has become an indispensable necessity for successful classroom instruction; fundamentally, such media must be dynamic, keeping pace with progress and driving the innovation and novelty required in the learning process.[4] However, a lack of innovation in developing instructional media can hinder the achievement of educational goals. The implementation of the Kurikulum Merdeka (Independent Curriculum) emphasizes the importance of learner-centered and contextual learning. Under this approach, students are encouraged to participate actively in the learning process, develop critical thinking skills, and connect the material they study to real-life

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[1] Siti Muvidah Nur Afifah et al., *Inovasi Media Pembelajaran Untuk Mata Pelajaran Ipas* (Cahya Ghani Recovery, 2023).

[2] Hidayat Hidayat, Ilham Ilham, and Restu Maria Ningsih, "Penggunaan Media Pembelajaran Digital Pada Pembelajaran IPAS Di Sekolah Dasar," *Ainara Journal (Jurnal Penelitian Dan PKM Bidang Ilmu Pendidikan)* 5, no. 4 (2024): 424–30.

[3] S. Maulana, D., Saputro, B., & Lestari, "Desain Pembelajaran Abad 21 Berbasis Media Digital Dalam Meningkatkan Kompetensi Siswa," *Jurnal Sadewa* 7, no. 2 (2023): 55–66.

[4] C. B. Maulana, R., & Filzah, "Optimalisasi Media Digital Dalam Desain Pembelajaran Abad 21," *Jurnal Sadewa* 3, no. 2 (2025): 233–42, https://doi.org/https://doi.org/10.61132/sadewa.v3i1.1440.

experiences and issues. Consequently, learning focuses not merely on mastering content but also on the holistic development of students' competencies and character.[5] Without sustained innovation, the learning process risks becoming monotonous and failing to align with the current needs and development of students. As a result, students may lack the motivation to engage actively in learning including in the development of cultural literacy skills, which remain essential for navigating the challenges of life in a diverse society.

Enhancing cultural literacy can be achieved by developing digital learning media a strategic solution needed by teachers for instructional delivery.[6] Digital media offers broader opportunities for presenting learning materials and fostering students' literacy skills. Through interactive and engaging features, digital media can boost student engagement in the learning process. Furthermore, its flexibility allows learning materials to be accessed anytime and anywhere, thereby supporting a more effective learning process tailored to students' needs in the digital era.[7] Particularly at the primary school level, the use of digital learning media such as e-comics can support improvements in literacy and student enthusiasm for the subject matter. This is supported by research from Putri et al.,[8] which found that using e-comics in Grade IV Natural and Social Sciences (IPAS) lessons significantly improved students' cultural literacy and comprehension of the material. As a form of digital learning media, e-comics present information through a blend of text and engaging illustrations.[9] The visual characteristics of e-comics help students understand reading content as well as abstract concepts. Presenting material through a combination of text and appealing illustrations provides students with a learning experience that is both enjoyable and easier to comprehend. Moreover, e-comics can integrate local wisdom values, serving not only as a medium for delivering academic content but also as a means to introduce local culture and values to students. Such efforts are crucial in helping students recognize their own identities and their surrounding environments, while also supporting the strengthening of cultural

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[5] Sepling Paling et al., *Media Pembelajaran Digital* (Tohar Media, 2024).

[6] Maulana, D., Saputro, B., & Lestari, "Desain Pembelajaran Abad 21 Berbasis Media Digital Dalam Meningkatkan Kompetensi Siswa."

[7] Santy Afriana and Andi Prastowo, "Penggunaan Media Pembelajaran E-Comic Dalam Menumbuhkan Motivasi Dan Antusiasme Belajar Peserta Didik Sekolah Dasar," *Didaktis: Jurnal Pendidikan Dan Ilmu Pengetahuan* 22, no. 1 (2022): 41–56.

[8] Septya Khusnia Putri, A S A MZ, and Oriza Zativalen, "Efektifitas Penggunaan Media Pembelajaran E-Comic Dalam Meningkatkan Pemahaman Materi IPA Kelas V Sekolah Dasar," *Edukatif: Jurnal Ilmu Pendidikan* 6, no. 1 (2024): 1042–49.

[9] Ainatur Rasyika et al., "Pengaruh Media Pembelajaran E-Komik Berbasis Kearifan Lokal Terhadap Kemampuan Literasi Membaca Siswa Kelas V SDN Karangduak II," *Jurnal Ilmiah Research Student* 2, no. 1 (2025): 138–44.

literacy an area that currently remains low.[10] Issues regarding low cultural literacy have also been observed among primary school students, including those at SD Negeri 3 Bringin.

Based on initial observations conducted on October 4, 2024 specifically a diagnostic assessment of 25 fourth-grade students it was found that their level of cultural literacy remains low. Only 28% of the students were able to name two distinctive features of local culture, while the remaining 72% could not accurately identify them. Furthermore, only 19% of the students demonstrated an interest in the cultural values of their surroundings, whereas the majority (81%) showed a lack of interest and participation in discussions regarding local culture. Students generally struggled to identify local cultural characteristics and showed little interest in understanding the cultural values prevalent in their environment. This situation reflects a gap between the instructional material provided and the local cultural context that could and should be integrated into the learning process. Consequently, developing digital learning media emerges as a strategic solution to address this challenge. Digital media enables the presentation of material in a manner that is more interactive, engaging, and accessible to students, thereby enhancing their engagement in the learning process. In line with this, emphasize that teachers need to optimize the use of technology in instruction to create learning experiences that align with contemporary trends and the specific characteristics of the students. One form of digital media with significant potential to support this objective is the e-comic.[11]

Various research findings indicate that e-comics are effective in enhancing students' understanding of learning materials while fostering active engagement in the learning process. Putri et al. demonstrated that the use of e-comics in fourth-grade Natural and Social Sciences (IPAS) instruction significantly improves cultural literacy.[12] E-comics offer the advantage of conveying information through engaging visuals[13] and can bridge the understanding of abstract concepts through narrative and illustration.[14] However, the use of e-comics that specifically incorporate local wisdom to strengthen cultural literacy remains

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[10] Ira Ainun Zulfiah, Nurul Hidayah, and Hasan Sastra Negara, "Pengembangan Media Pembelajaran Komik Berbasis Virtual Pada Kelas V SD/MI," *Terampil: Jurnal Pendidikan Dan Pembelajaran Dasar* 9, no. 1 (2022): 59–68.

[11] Maulana, D., Saputro, B., & Lestari, "Desain Pembelajaran Abad 21 Berbasis Media Digital Dalam Meningkatkan Kompetensi Siswa."

[12] Putri, MZ, and Zativalen, "Efektifitas Penggunaan Media Pembelajaran E-Comic Dalam Meningkatkan Pemahaman Materi IPA Kelas V Sekolah Dasar."

[13] Rasyika et al., "Pengaruh Media Pembelajaran E-Komik Berbasis Kearifan Lokal Terhadap Kemampuan Literasi Membaca Siswa Kelas V SDN Karangduak II."

[14] Zulfiah, Hidayah, and Negara, "Pengembangan Media Pembelajaran Komik Berbasis Virtual Pada Kelas V SD/MI."

very limited, particularly at the primary school level. Few learning media explicitly integrate local cultural content into digital formats that appeal to students. This is where the research gap lies: there is a need for digital learning media that are not only interactive but also rooted in local culture, serving to strengthen students' cultural literacy from an early age.

The novelty of this research lies in the development of local wisdom-based e-comic media specifically designed to enhance the cultural literacy of elementary school students. Unlike previous studies that primarily focused on improving learning outcomes or reading skills, this research integrates local cultural values as the core learning content within a flipbook-based digital medium. In addition to providing an interactive learning experience, the developed medium presents a cultural context that resonates with the students' daily lives, thereby fostering more meaningful cultural literacy.

Research Methods

This study employs the Research and Development (R&D) method using the 4D development model (Define, Design, Develop, Disseminate).[15] The research was conducted at SD Negeri 3 Bringin, with fourth-grade students serving as the research subjects. A total sampling technique was used, meaning the entire population was included in the study due to the relatively small population size; consequently, the sample consisted of 25 students. The research procedure began with the Define stage, aimed at identifying learning needs, student characteristics, and existing learning conditions. The Design stage focused on creating e-comic media that integrates local wisdom based on the local socio-cultural context. During the Develop stage, the media was created and validated by experts, followed by a limited trial to gather feedback for improvement. Finally, the Disseminate stage involved the limited dissemination and implementation of the product at the research site, SD Negeri 3 Bringin.

Data collection involved expert validation questionnaires, teacher and student response questionnaires, and pretest and posttest instruments to measure students' cultural literacy. The data were analyzed using quantitative descriptive techniques to determine the media's feasibility and practicality. Media effectiveness was assessed through normality tests, N-Gain calculations, and a comparison of pretest and posttest results. The analysis results served to determine the effectiveness of the local wisdom-based e-comic learning media in enhancing students' cultural literacy. The resulting product is a digital e-comic learning

[15] Ria Chandra Kartika et al., "Developing Educational Animation on Food Additives for Young Learners Using the 4D Model," *International Journal of Healthcare and Information Technology* 3, no. 2 (2026): 170–76.

medium incorporating local wisdom that is feasible, practical, and effective for use in instruction to improve the cultural literacy of elementary school students.

Result and Discussion

This study was conducted at SD Negeri 3 Bringin, Jepara Regency, during the 2025/2026 academic year. The research aimed to design and develop digital learning media in the form of e-comics based on local wisdom for use in the instructional process. Furthermore, the study sought to assess the feasibility, practicality, and effectiveness of the developed media in enhancing the cultural literacy of fourth-grade students regarding Theme 6, "Indonesia: Rich in Culture" specifically the topic "My Region's Natural and Cultural Wealth." The development of this media is expected to foster learning experiences that are engaging, interactive, contextual, and meaningful, while also contributing to efforts to improve cultural literacy among elementary school students. The study employed the 4D development model (Define, Design, Develop, and Disseminate). Each stage of the model was executed systematically to produce a final product aligned with learning needs. The implementation of each development stage carried out in this study is described in detail in the following section.

1. Define

During the Define stage, data was collected through interviews with the Grade 4 teacher at SD Negeri 3 Bringin to gather preliminary information regarding the learning environment and the various challenges encountered during the instructional process. The interviews focused on several aspects, including the teaching methods employed, available instructional media, and the characteristics of the students serving as the research subjects. The interview results revealed that one of the issues facing the learning process was the students' still-low level of cultural literacy.

Several factors contribute to the low level of cultural literacy among students. One such factor is the continued reliance on conventional and unvaried teaching methods, which fail to effectively capture students' attention or maximize their engagement. This situation negatively impacts students' interest in learning and their participation during the instructional process. Furthermore, the limited range of instructional media with a heavy reliance on student worksheets deprives students of interactive and meaningful learning experiences. Such limited variety in instructional media can adversely affect student engagement, the quality of the learning process, and overall learning outcomes.

Based on these findings, there is a need to develop innovative and engaging learning media that align with the characteristics of elementary school students. The development of digital e-comic-based learning media integrated with local wisdom is expected to create a more enjoyable learning atmosphere, enhance student engagement in the learning process, and optimally support the improvement of cultural literacy and learning outcomes.

2. Design

Design During the design phase, the researcher developed a learning medium in the form of an e-comic based on local wisdom, tailored to learning needs and the characteristics of fourth-grade students. The design process began with outlining the storyline, defining characters, selecting relevant local cultural content, and creating a storyboard to guide the medium's development. The cultural content presented in the e-comic was based on observations of local wisdom in the school's surrounding environment such as the values of mutual cooperation (gotong royong) and togetherness, as well as various cultural practices within the local community.

The e-comic medium was developed using a flipbook platform, featuring colorful illustrations with charming, engaging characters, a balanced text layout, and dialogue crafted with simple language and presentation to ensure easy comprehension for elementary school students. Through the development of this e-comic medium grounded in local wisdom it is hoped that cultural literacy education will become more engaging, contextual, and meaningful. Beyond enhancing students' understanding of the learning material, the medium is intended to serve as an educational tool for instilling values of local wisdom. Consequently, students not only acquire academic knowledge but also develop an awareness of and concern for the importance of preserving regional culture as a heritage that must be safeguarded and sustainably nurtured. The design of the local wisdom-based e-comic is illustrated in Figure 1.

Figure 1. Design of the local wisdom-based e-comic.

Figure 1 illustrates an e-comic based on local wisdom that facilitates learning through the concept of "learning while playing." The comic was created using a flipbook platform, allowing for digital access and providing a more interactive learning experience. The media design prioritizes an engaging visual style tailored to the characteristics of elementary school students; this is achieved through the use of appealing illustrations, a harmonious color scheme, a clear text layout, and simple dialogue that is easy for students to understand.

3. Development

At this stage, the finalized design is transformed into a physical form specifically, the actual learning medium. The ethnomathematics comic is produced as a book using thick, colored paper to ensure durability and a polished appearance. Before being implemented in the learning process, the medium undergoes validation by experts in media and subject matter. Expert evaluations are conducted to assess the suitability of the developed medium. The results of these evaluations are then analyzed quantitatively and presented in the table below.

Table 1. Media Validation Test

Assessment Aspect	Trial Subjects		Total Score	Max. Score	Validation Percentage	Category
	Media Expert 1	Media Expert 2				
Graphics	56	59	115	128	89,84%	Highly Suitable
Presentation	45	45	92	104	88,46%	Highly Suitable
Total	101	106	207	232	89,22%	Highly Suitable

Table 1. Based on the assessment conducted by two media expert validators, the local wisdom-based e-comic achieved a score of 207 out of a maximum of 232, resulting in a feasibility percentage of 89.22%. These results induicate that the developed media falls into the "highly feasible" category for use in the learning process. Regarding the graphic design aspect, the media achieved a score of 89.84%. This figure demonstrates that the e-comic's visual elements such as illustrations, color selection, layout, typography, and overall design align with the learners' characteristics and effectively support a more engaging learning experience. Meanwhile, the presentation aspect scored 88.46%, indicating that the material is systematically organized, easy to understand, and benefits from strong coherence among the media's components.

During the validation process, media experts offered several recommendations for improvement, including standardizing font sizes across certain sections, adding usage instructions to facilitate user experience, and adjusting color contrast on specific pages to optimize readability. Following revisions based on this feedback, the local wisdom-based e-comic was deemed highly suitable for the implementation stage. These findings indicate that the developed medium possesses a high level of quality and reliability as a learning tool. Nevertheless, further refinement of the presentation remains necessary to maximize the medium's quality, thereby ensuring a more engaging, interactive, and meaningful learning experience for students.

Table 2. Content Expert Validation Results

Assessment Aspect	Trial Subjects		Total Score	Maximum Score	Validation Percentage	Category
	Content Expert 1	Content Expert 2				
Content	36	37	73	80	91,25%	Highly Suitable
Language	18	22	43	48	89,58%	Highly Suitable
Suitability	23	18	50	56	89,29%	Highly Suitable
Total	82	84	166	184	90,22%	Highly Suitable

Table 2. Based on validation results from two subject matter experts, the local wisdom-based e-comic media achieved a score of 166 out of a maximum of 184, resulting in a feasibility percentage of 90.22%. These results indicate that the developed media falls into the "highly feasible" category for use as a learning resource in elementary schools. Regarding content suitability, the media achieved the highest percentage at 91.25%. This demonstrates that the material presented in the e-comic aligns with the learning outcomes, learning objectives, and characteristics of fourth-grade elementary school students.

Furthermore, the presented material is considered relevant to learning needs and capable of supporting the strengthening of students' cultural literacy. The linguistic aspect achieved a score of 89.58%, indicating that the language used is easy to understand, communicative, and appropriate for the students' developmental level. Meanwhile, the instructional suitability aspect scored 89.29%, indicating that the e-comic medium is capable of creating a learning experience that is more engaging, interactive, and meaningful.

During the validation process, subject matter experts provided input to refine the product, including suggestions to incorporate examples of local culture that resonate with the students' daily lives and to adjust certain dialogues to make them more communicative and contextually appropriate for learning. This feedback served as the basis for revising the developed media. Following these improvements, the local wisdom-based e-comic was deemed highly suitable for use in learning activities. Overall, the validation results indicate that the material within the media is of excellent quality regarding content, language, and instructional suitability. Given this quality, the local wisdom-based e-comic serves as an effective alternative learning medium to support the enhancement of cultural literacy among elementary school students.

4. Disseminate

This stage is carried out after the local wisdom-based e-comic medium has been validated by media and subject matter experts. At this stage, the medium is tested with teachers and fourth-grade students at SDN 3 Bringin to determine its level of practicality in the learning process. Practicality is assessed using questionnaires administered to the teachers and students. Ratings are based on a four-point Likert scale: disagree (score 1), somewhat disagree (score 2), agree (score 3), and strongly agree (score 4).

The practicality assessment covers several aspects: the media's appearance, usability, material delivery, and the utilization of the media within the learning process. Prior to the trial, the researcher prepared the necessary instructional materials comprising teaching modules, learning resources, student worksheets, and evaluation instruments to support the lesson. This trial aimed to determine the ease of use of the developed e-comic media. The results of the practicality assessment conducted by the Grade IV teacher at SDN 3 Bringin are presented in the following table.

Table 3. Results of the Practicality Test by Grade IV Teachers

Total Score	Maximum Score	Percentage	Category
90	100	90%	Highly Practical

Based on Table 3, the results of the practicality test conducted by teachers indicate that the local wisdom-based e-comic media possesses a very high level of practicality, with a score of 90%. These findings demonstrate that the developed media meets criteria regarding ease of use, visual appeal, and effectiveness in supporting the delivery of learning material. Teachers also assessed that the media fosters a more interactive learning atmosphere and

enhances student engagement during lessons. Consequently, the local wisdom-based e-comic serves as a practical and relevant alternative learning medium for use in elementary schools.

Table 4. Practicality Test Results by Grade IV Students

Total Score	Maximum Score	Percentage	Category
278	300	92,67%	Highly Practical

Based on Table 4, the practicality test results involving 25 fourth-grade students show that the local wisdom-based e-comic medium achieved a score of 278 out of a maximum of 300, resulting in a practicality percentage of 92.67%. This result falls into the "highly practical" category, indicating a positive response from students during the learning process. Students found the e-comic easy to use and visually appealing, noting that it helped them better understand the cultural material. Presenting content through illustrated stories also fostered interest in learning, reading, and exploring local culture. Furthermore, the use of illustrations and characters that resonate with daily life made the learning experience more enjoyable and interactive. This high level of practicality demonstrates that the local wisdom-based e-comic was well-received by students and effectively supported the learning process. The medium holds the potential to create a more engaging and meaningful learning experience while helping to enhance the cultural literacy of elementary school students.

The final stage of this research is the evaluation phase, which aims to determine the effectiveness of the developed local wisdom-based e-comic learning media in enhancing students' cultural literacy. Effectiveness was measured through several stages of data analysis, beginning with a normality test as a prerequisite, followed by a paired-sample t-test to identify differences in results before and after using the media. The normality test was conducted using the Shapiro-Wilk method with the aid of SPSS version 25 software. This testing aimed to ensure that the research data followed a normal distribution, thereby meeting the requirements for parametric statistical analysis. The resulting normality test data were then analyzed quantitatively to determine the effectiveness of the developed local wisdom-based e-comic media.

Table 5. Normality Test Results

	Statistic	df	Sig.
Pretest	.949	25	.244
Posttest	.960	25	.424

Based on Table 5, the normality test results using the Shapiro-Wilk method show that the pretest data yielded a statistic of 0.949 with a significance value (Sig.) of 0.244, while the posttest data yielded a statistic of 0.960 with a significance value of 0.424. Both datasets had 25 degrees of freedom (df). Since the significance values for both the pretest and posttest data exceeded 0.05, it can be concluded that both datasets are normally distributed. Thus, the research data met one of the assumptions for parametric statistical analysis, making it suitable for proceeding to the next stage of testing using the paired sample t-test.

Table 6. Paired Sample T Test Results

	Paired Differences							
	Mean	Std. Deviation	Std. Eror Mean	95%Confidence Interval of the Difference Lower	Upper	T	df	Sig. (2-tailed)
Pair 1 Pretest Posttest	-13.200	1.000	.200	-13.613	-12.787	-66.000	24	.001

Based on Table 6, the Paired Samples t-test results indicate a difference between students' pretest and posttest scores following the use of local wisdom-based e-comic media. The analysis yielded a calculated t-value of -66.000 (df = 24) and a significance value (Sig. 2-tailed) of 0.001. Since the significance value is less than 0.05, there is a significant difference between the pretest and posttest scores. These results demonstrate that the use of local wisdom-based e-comic media can improve students' learning outcomes and cultural literacy. Thus, the developed media is deemed effective for use in the primary school learning process.

Table 7. N-Gain Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_Skor	25	.57	1.00	.7417	.10541
Valid N (listwise)	25				

Based on Table 7, the descriptive statistical analysis indicates that the research data comprises 25 samples, with minimum and maximum values of 0.57 and 1.00, respectively.

The obtained mean N-Gain score was 0.7417, suggesting that the students' level of understanding prior to the intervention fell into the "fairly good" category. Following the intervention, the mean post-test score reached 1.00; according to N-Gain interpretation criteria, this value falls into the "high" category. These results demonstrate that the implemented instruction successfully fostered a significant improvement in student understanding. Consequently, the learning media and methods employed can be considered effective in supporting the achievement of learning objectives and enhancing student learning outcomes.

The research results indicate that the development of local wisdom-based e-comic learning media, implemented at SDN 3 Bringin, positively influenced the improvement of learning outcomes for fourth-grade students, particularly regarding cultural literacy. The use of the 4D development model (Define, Design, Develop, Disseminate) proved effective in providing a systematic framework for creating learning media tailored to the students' needs and characteristics. These findings align with the study by Hidayah et al. (2025), which noted that monotonous and unvaried teaching methods can lead to low interest and motivation among elementary school students. Therefore, innovation in the learning process is essential specifically through the use of more engaging, interactive, and contextual media to foster active student participation in learning activities.

The implementation of e-comics based on local wisdom not only contributes to enhancing students' understanding of learning materials but also helps introduce and instill local cultural values in them. Thus, the developed media is capable of addressing the cognitive, social, and cultural aspects of the students. These research findings reinforce the importance of utilizing innovative learning media to improve the quality of instruction and support the strengthening of cultural literacy in primary schools.

Research results indicate that the development of e-comic media based on local wisdom successfully addressed the issues identified during the needs analysis stage. Initial observations and interviews revealed that the low level of cultural literacy among fourth-grade students at SDN 3 Bringin stemmed from a lack of innovative learning media. Teachers predominantly relied on student worksheets (LKS) as learning resources, resulting in cultural instruction that was largely text-based and failed to engage the students. This situation contributed to a lack of student interest in the local culture of their immediate environment. Consequently, the e-comic media was developed by integrating visual elements, storytelling, and local wisdom values relevant to the students' lives. This approach

was selected because elementary school students more readily grasp material presented through engaging imagery and storylines. These findings align with the view that visual-based digital media can enhance student engagement in learning and facilitate the comprehension of concepts.[16] Thus, the developed media serves not only as a vehicle for delivering content but also as a tool to strengthen students' cultural literacy.

Media expert validation yielded a score of 89.22% (categorized as highly suitable), while subject matter expert validation resulted in 90.22% (also highly suitable). These results indicate that the developed media meets standards regarding graphics, presentation, content, language, and instructional suitability. The high validation scores demonstrate that the e-comic effectively presents cultural material in a systematic manner that is easily understood by elementary school students. Engaging illustrations, appropriate color usage, and communicative dialogue contribute to the media's quality. Furthermore, the content aligns with the learning outcomes and characteristics of fourth-grade students. These findings indicate that the media development process, utilizing the 4D model, successfully produced a product that meets instructional needs. This study is supported by research from Basari et al.,[17] which identifies visual design quality and content suitability as key factors determining the success of digital learning media in elementary schools. Consequently, the local wisdom-based e-comic is a suitable alternative learning medium for enhancing students' cultural literacy.

The practicality of the media also yielded excellent results. Based on practicality test findings, teachers rated it at 90%, while students gave it a rating of 92.67%. These figures indicate that the media is user-friendly and well-received by its users. Teachers noted that the media made the process of delivering material more engaging and interactive. Meanwhile, students found it easier to grasp cultural concepts through the stories and illustrations featured in the e-comic. The use of a digital platform also offered a distinct learning experience compared to conventional instruction relying solely on printed textbooks. These findings demonstrate that the developed media successfully fosters a more active and

[16] I Wayan Ade Yantika, Ida Bagus Putrayasa, and I Nyoman Sudiana, "Development of a Local Wisdom–Based Digital Comic Media Integrating the Sidakarya Mask to Enhance Cultural Literacy and Reading Outcomes in Primary Education," *Jurnal Paedagogy* 13, no. 2 (2026): 579–89.

[17] Achmad Basari Eko Wahyudi et al., "Local Wisdom-Based Science e-Module to Improve Cultural Literacy and Critical Thinking Skills of Elementary School Students," *Journal of Environment and Sustainability Education* 3, no. 3 (2025): 387–95.

enjoyable learning environment. This aligns with research by Yulia et al.,[18] which found that digital e-comics enhance student learning comfort and facilitate the delivery of instructional material for teachers. The high level of practicality indicates that the media has the potential for broader implementation in primary school education.

The effectiveness of the media is evident from the Paired Sample t-Test results, which show a significance value of 0.001 below the 0.05 threshold. These results demonstrate a significant difference in students' cultural literacy skills before and after using the local wisdom-based e-comic media. Furthermore, the N-Gain analysis result of 0.7417 falls into the high category. These findings indicate that the developed media positively influenced the improvement of students' cultural literacy. This improvement occurred because students gained more concrete learning experiences through a combination of images, stories, and local cultural contexts relevant to their daily lives. Cultural content was no longer perceived as abstract information but became part of a meaningful learning experience. These findings support the research of Pratiwi et al.,[19] which explains that local wisdom-based learning can enhance literacy skills while simultaneously strengthening students' cultural identity. Thus, the use of local wisdom-based e-comics is proven effective in improving the cultural literacy of elementary school students.

The results of this study align with research conducted by Hamidah et al.,[20] who developed digital comics based on local wisdom for elementary school students. That study demonstrated that digital comics incorporating local wisdom achieved a very high level of validity and elicited positive responses from students during the learning process. The similarity between the two studies lies in the use of digital comics as a medium to facilitate learning that is more contextual and engaging. However, this study differs in its development focus, which is specifically directed toward enhancing students' cultural literacy. Furthermore, the cultural content employed was tailored to the socio-cultural context of the SDN 3 Bringin environment, thereby making it more relatable to the students' own lives. This contextual relevance enables students to more easily understand and internalize the

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[18] Gustina Yulia, Weni Yulastri, and Rahmatul Hayati, "The Effectiveness of Local Wisdom-Based Interactive E-Comics on Learning Outcomes and Motivation in Elementary Students," *Edunesia: Jurnal Ilmiah Pendidikan* 7, no. 1 (2026): 735–51.

[19] Made Utari Mega Pratiwi, I Gede Margunayasa, and Dewi Arum Widhiyanti Metra Putri, "Komik digital berbasis kearifan lokal bali 'subak' pada materi ekosistem untuk meningkatkan literasi sains kelas V SD," *Pendas: Jurnal Ilmiah Pendidikan Dasar* 11, no. 01 (2026): 109–24.

[20] M Z Hamidah, LAIU Khasanah, and A Susandi, "Development of Digital Comic Media Based on Local Wisdom with the Theme of Love Indonesia in Elementary School," *Jurnal Tematik* 14, no. 1 (2025): 32–38.

cultural values being conveyed. Consequently, the findings of this study further reinforce the importance of integrating local culture into digital learning media.

This study has several limitations that warrant attention. First, the research was conducted at a single elementary school with a sample of 25 fourth-grade students; consequently, the findings cannot be generalized to schools with different characteristics. Second, the implementation of the e-comic media took place over a relatively short period, meaning the study could not assess the long-term sustainability of improvements in students' cultural literacy. Third, the incorporated local wisdom content focused specifically on the culture of the Jepara Regency; therefore, further development is needed to accommodate local wisdom from other regions, thereby broadening the media's scope of application. Consequently, future research should involve larger sample sizes and schools with diverse characteristics, as well as long-term effectiveness testing, to provide a more comprehensive picture of the impact of local wisdom-based e-comic media on students' cultural literacy.

Conclusion

This study successfully developed an e-comic learning medium based on local wisdom covering the topic "Indonesia: Rich in Culture" (Theme 6) for fourth-grade students at SDN 3 Bringin, utilizing the 4D development model (Define, Design, Develop, Disseminate). During the "Define" stage, it was found that students' cultural literacy was low, as instruction tended to rely on limited and unengaging media. Subsequently, in the "Design" and "Develop" stages, the e-comic medium was created by integrating local wisdom values relevant to the students' lives, thereby making the learning process more contextual and meaningful. Feasibility test results indicate that the developed media achieved a validation score of 89.22% from media experts and 90.22% from subject matter experts, both falling into the "highly feasible" category. Furthermore, practicality test results showed ratings of 90% from teachers and 92.67% from students, placing the media in the "highly practical" category. These findings demonstrate that the local wisdom-based e-comic media is user-friendly, engaging, and capable of effectively supporting the learning process. Effectiveness test results indicate that local wisdom-based e-comic media significantly enhances students' cultural literacy. This is evidenced by the Paired Sample t-Test results, which yielded a significance value of 0.001 ($p < 0.05$), indicating a significant difference in students' abilities before and after using the media. Furthermore, the N-Gain score of 0.7417 falls into the high category, demonstrating that the use of the media effectively improves students' cultural literacy.

Thus, the local wisdom-based e-comic media developed in this study is deemed valid, practical, and effective for use in elementary school instruction. This research contributes to the development of digital learning media that not only supports the achievement of learning objectives but also plays a role in instilling local cultural values and strengthening students' cultural literacy from an early age. The study's novelty lies in the integration of local wisdom into digital e-comic media designed with a contextual approach to enhance the cultural literacy of elementary school students within the context of 21st-century learning.

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