
Development of CTL (Contextual Teaching and Learning)-Based E-Comic Media for Teaching Cultural Diversity to Fourth-Grade Elementary School Students

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Abstract

This study aimed to develop a Contextual Teaching and Learning (CTL)-based e-comic for cultural diversity learning in grade IV and to determine its validity, practicality, and effectiveness. The study employed the ADDIE research and development model, consisting of analysis, design, development, implementation, and evaluation. The product integrated contextual learning activities with local cultural elements and was evaluated by media, language, and subject-matter experts. Practicality was examined through teacher responses and one-to-one and small-group trials, whereas effectiveness was assessed using pretest and posttest scores from 32 students. The expert validation yielded an average score of 96%, indicating that the product was highly valid. The practicality assessment reached 95%, indicating that the media was highly practical. Students' mean score increased from 54.49 on the pretest to 82.52 on the posttest, with an N-gain of 0.62 in the moderate category. These findings indicate that the CTL-based e-comic is valid, practical, and effective for supporting meaningful cultural diversity learning in elementary school.

Keywords– ADDIE; contextual teaching and learning; cultural diversity; e-comic



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1. Introduction

Indonesia has a diversity of cultures, religions, races, languages, and geographical conditions that need to be understood since primary education. Education plays a role in forming students who are knowledgeable, tolerant, and able to appreciate differences. Quality education is not only oriented to cognitive development, but also to social, emotional, and ethical development. Therefore, the learning process needs to be systematically designed to be able to produce human resources that develop in line with the progress of science and technology (Okdiansyah et al., 2021).

The quality of learning is influenced by the accuracy of the strategies and media used. Relevant learning media can help teachers deliver messages in a planned manner, increase student engagement, and create meaningful learning experiences. The use of multimedia also has the potential to strengthen students' cognitive skills because the material is presented through a combination of text, images, and visual elements that are easier to understand (Satria & Egok, 2020). Innovative strategies and media are needed so that learning becomes interactive, contextual, and in accordance with the characteristics of students (Novita et al., 2025).

Technological developments encourage the use of computers, smartphones, projectors, and digital media in learning activities. Interactive media can increase learning motivation and help students understand complex material (Sulistiawati, 2023). However, the results of observations and interviews with grade IV teachers of SD Negeri 18 Lubuklinggau on October 11, 2025 show that the use of digital media is still limited due to access and technology operation constraints. Learning is still dominated by lecture methods. Preliminary data showed that 15 students had reached completion, while 17 students had not completed it, with an average grade of 64.60. This condition is accompanied by low enthusiasm, participation, and involvement of students during learning.

Cultural diversity material requires a concrete presentation because it contains various concepts, examples, and social values. Delivery that relies only on lectures can make the material feel abstract and monotonous. Digital media

that connects materials with daily life has the potential to increase students' interest and motivation to learn (Yusnaldi et al., 2025). One of the media that can be used is e-comics, which are digital comics that convey material through storylines, dialogues, illustrations, and visual context. This presentation can help students understand information more interestingly than using text alone (Yuliani & Setiawan, 2024).

Previous research has shown that digital comics on cultural diversity materials can increase student engagement and learning outcomes (Andini et al., 2022; Talia et al., 2025). The development of e-comics is also considered feasible based on aspects of material, media, and language (Yuza & Ningrum, 2025). However, some research still focuses on the feasibility of digital comics or improving learning outcomes in general. The development of media that integrates e-comics, the Contextual Teaching and Learning (CTL) approach, elements of Lubuklinggau's local culture, and testing of validity, practicality, and effectiveness in one ADDIE series is still limited.

CTL relates learning materials to real situations so that students can build knowledge through experience, discussion, collaboration, and problem-solving. This approach transforms teacher-centered learning into a multidirectional interaction between teachers, learners, and the learning environment (Har et al., 2025). The integration of CTL with digital comics allows the concept of cultural diversity to be learned through stories that are close to the lives of students. The development of CTL-based comics is also reported to be able to support cultural introduction and language development through meaningful contexts (Mislannafsiah & Astini, 2025).

Canva was chosen as a development app because it provides templates, illustrations, layouts, and design features that can be used to create digital teaching materials efficiently. The app has been leveraged to develop a variety of media, including teaching materials, comics, animated videos, and storybooks (Shelly et al., 2023). The novelty of this research lies in the development of CTL-based e-comics that use the local culture of Lubuklinggau as the context of the

story and is thoroughly tested through the aspects of validity, practicality, and effectiveness. This research supports previous findings on the benefits of digital comics, while expanding them through the integration of local contexts and CTL approaches. The purpose of the research is to produce CTL-based e-comic media on cultural diversity materials that are valid, practical, and effective for grade IV students.

2. Method

This research uses research and development methods with the ADDIE model which includes the analysis, design, development, implementation, and evaluation stages. The ADDIE model was chosen because it provides a systematic, iterative learning development procedure, and allows for product revision at every stage (Branch, 2009). The research was carried out at SD Negeri 18 Lubuklinggau with the implementation test subjects of 32 students in class IVB.

The analysis stage includes the analysis of the needs, characteristics of students, materials, and conditions of use of digital media. The design stage includes the preparation of learning objectives, storyline, script, character design, setting, illustrations, colors, and research instruments. The development stage produces e-comics in digital flipbook format, then the product is validated by three experts who each assess the media, language, and material aspects. The revised product was tested for practicality through educator responses, one-to-one tests, and small group tests. At the implementation stage, the product is used in large classroom learning by providing pretest and posttest. The evaluation stage is carried out formatively at each stage and summative after implementation.

The research instruments consist of observation and interview guidelines, expert validation sheets, questionnaires on the practicality of educators and students, and learning outcome tests. The test questions were first tested for quality and 15 items were obtained that were suitable for use based on the analysis of validity, reliability, difficulty, and differentiating power. Qualitative data in the form of validator suggestions is used to revise the product. Quantitative data from validation and practicality are analyzed in the form of percentage scores. Effectiveness was analyzed based on changes in the average pretest and posttest scores using normalized gain or N-gain, which is the difference in posttest and pretest scores

divided by the difference between the maximum and pretest scores. The N-gain category consisted of high ($g \geq 0.70$), medium ($0.30 \leq g < 0.70$), and low ($g < 0.30$) (Hake, 1998).

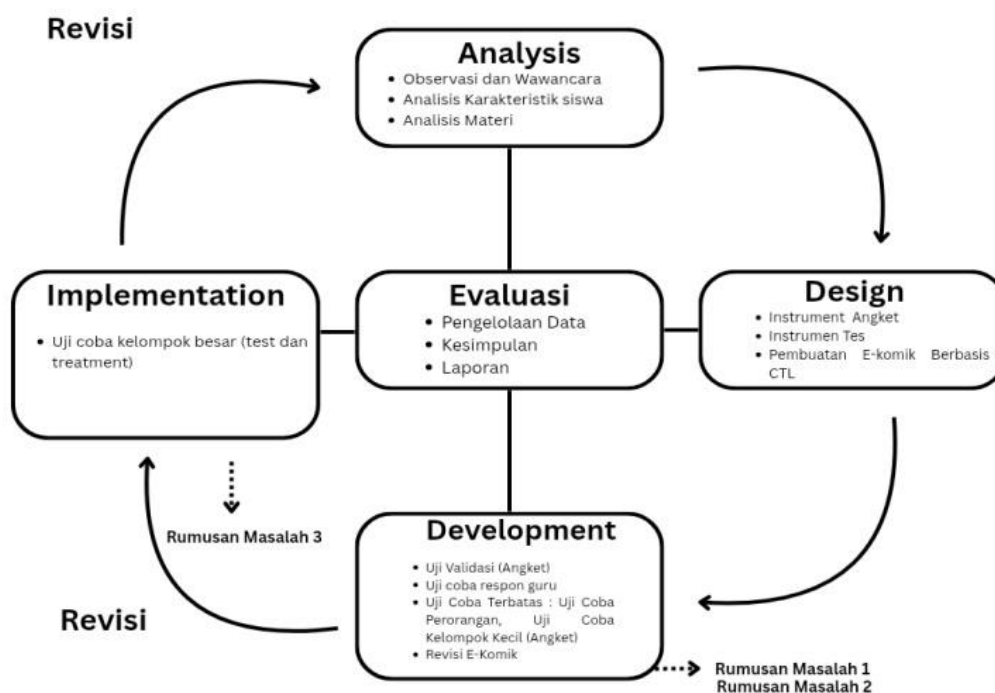


Figure 1. Prosedur pengembangan media dengan model ADDIE

3. Result and Discussion

The results of the needs analysis show that the learning process of cultural diversity material is still dominated by lecture methods and has not utilized digital media optimally. Students tend to be passive, lack enthusiasm, and have not been consistently involved in questions and answers or discussions. These findings are the basis for the development of media that can present material visually, contextually, and easily operate.

At the design stage, the learning objectives, storylines, scripts, and elements of CTL are prepared by connecting cultural diversity materials with students' daily experiences. The product is designed using Canva and consists of a cover, foreword, table of contents, materials, illustrated stories, learning activities, and author biodata. The characters, setting, and illustrations raise elements of Lubuklinggau culture so that students can connect the concept with their social

environment. Bright colors and simple typefaces are chosen to maintain readability and increase interest in learning.



Figure 2. Contoh desain sampul dan halaman isi e-komik

The media design is realized into an e-comic in the form of a digital flipbook. The product is then validated by media experts, linguists, and material experts. The validation results are presented in Table 1.

Table 1. Results of expert validation of e-comic media

Aspek validasi	Validator	Skor	Persentase
Media	Dr. Dodik Mulyono, M.Pd.	56	93%
Bahasa	Dr. Satinem, M.Pd.	59	98%
Materi	Hodijah, S.Pd.	59	98%
Rata-rata			96% (sangat valid)

The average validation of 96% indicates that the media is in the very valid category. The assessment confirms that the content of the material is in accordance with the learning objectives, the language can be understood by grade IV students, and the media display supports the use in learning. This result is in line with the research of Yuza and Ningrum (2025) which shows that e-comics can meet valid criteria if the material, language, and visual design are developed according to the characteristics of students.

Media expert advice is used to improve the cover and content page. The revision of the cover was carried out by changing the background that originally did not reflect local culture to a display that displayed the characteristics of Lubuklinggau. In the content section, illustrations that are not in accordance with

the characteristics of cultural objects are replaced and descriptions are condensed to be more accurate, easy to read, and not burden students.

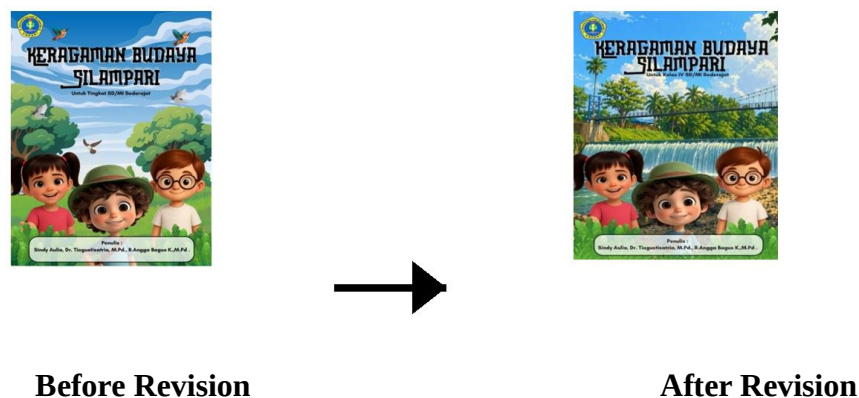
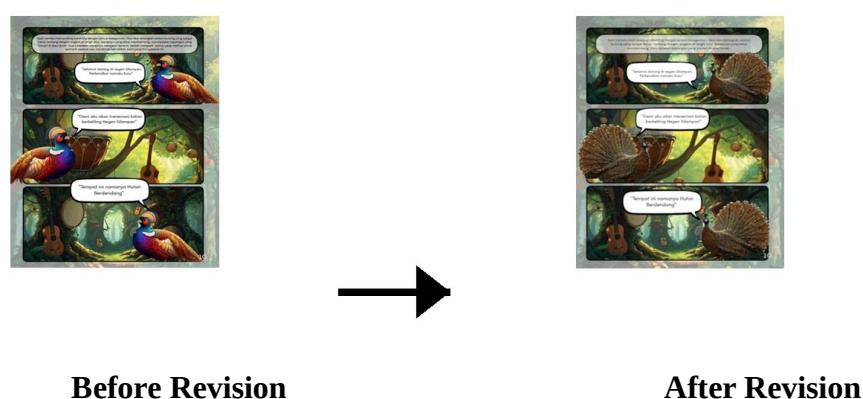


Figure 3. Cover revision based on media expert advice



The practicality test was carried out through educator response, one-to-one test, and small group test. The assessment includes ease of use, readability, attractiveness, clarity of instructions, and suitability of the media with learning activities. The recapitulation of the results of the practicality test is presented in Table 2.

Table 2. Practicality assessment recapitulation

Tahap penilaian	Skor	Persentase
Respons pendidik	148	99%
One-to-one	201	89%
Small group	443	98%
Rata-rata	95% (sangat praktis)	

The average practicality of 95% indicates that e-comics are very practical to use. Educators can operate the media easily, while learners can follow the storylines and activities provided. A lower one-to-one score than other stages indicates that there is a need for early improvements to certain instructions and displays. After the revision, the small group rating increased to 98%. These findings support the results of Talia et al. (2025) that digital comics in cultural diversity materials can be well received by students because their presentation is attractive and easy to understand.

The implementation was carried out on 32 students of class IV.B. Before learning, students did a pretest. Furthermore, e-comics are used in three learning activities with teacher assistance. After the activity is completed, students do the posttest. The data of the 32 individual scores in the source manuscript were recalculated to ensure consistency between the learner's score and the summary score. The results of the calculation are presented in Table 3.

Table 3. Summary of effectiveness test results

N	Rata-rata pretest	Rata-rata posttest	Peningkatan	N-gain	Kategori
32	54,49	82,52	28,03	0,62	Sedang

The average score increased from 54.49 to 82.52 with a difference of 28.03 points. The N-gain value of 0.62 is in the medium category. These results show that e-comics are effective in helping to improve learning outcomes, even though the improvement is not categorized as high. The use of the term "effective" in this study refers to the increase in pedagogically meaningful learning outcomes based on N-gain, not on the results of statistical significance tests.

Improved learning outcomes can be explained through a combination of narratives, illustrations, dialogues, and local contexts that help learners organize

information in a more concrete way. These results are in line with Andini et al. (2022), Agustini et al (2023) and Sunda Ainina Mayang (2025), who reported that digital comics on cultural diversity materials can improve learning outcomes and student motivation. Story-based visual media can also reduce monotonous impressions and encourage students to understand the material through situations that are close to their experiences (Yuliani & Setiawan, 2024).

Formative evaluation is carried out at each stage through the input of experts, educators, and students. Summative evaluation is carried out after implementation by analyzing the validity, practicality, and effectiveness of the product. Overall, the evaluation results showed that e-comics met the criteria of being very valid and very practical and produced a medium category N-gain. The final product has improved the aspects of the cover, the appropriateness of the illustrations, the readability, the density of the description, and the storyline.

E-comics have several advantages. First, media is flexible because it can be accessed through smartphones, laptops, or projectors. Second, the context of local culture makes the material closer to the students' experience. Third, the presentation of illustrated stories helps increase attention, activities, and motivation to learn. CTL integration also provides opportunities for students to connect the concept of cultural diversity with real situations, discuss, and build understanding through contextual learning experiences. These findings are consistent with the research of Mislannafsiah and Astini (2025) on the benefits of CTL-based comics in cultural introduction.

Media limitations are mainly related to the use of smartphones. Game apps, social media, and notifications can distract students if device usage is not supervised. Abrahamsson's (2026) research shows that smartphone restrictions may be related to improving educational outcomes, while Bela and Arafat (2026) emphasize that uncontrolled use of social media can affect students' concentration and behavior. Therefore, the use of e-comics needs to be accompanied by class management, time restrictions, disabling notifications or access to other applications, and teacher assistance. Further research also needs to use comparative groups and inferential statistical tests so that the influence of media can be determined more robustly.

4. Conclusion

Contextual Teaching and Learning-based e-comic media on cultural diversity materials is developed through the stages of analysis, design,

development, implementation, and evaluation. The product obtained an average of 96% expert validation with a very valid category and an average practicality of 95% with a very practical category. The use of media in 32 students increased the average score from 54.49 to 82.52, with an N-gain of 0.62 in the medium category. Thus, the media developed is suitable for use as an alternative learning to help students understand cultural diversity through visual stories and local contexts. The main impact of this research is the availability of digital media that can support more contextual, interesting, and meaningful learning. Implementation needs to be accompanied by monitoring of device use, while follow-up research is recommended involving control groups, wider school coverage, and long-term impact measurement.

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