

Development of Canva-Based Animated Video Media for Natural and Social Sciences Learning in Elementary Education

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Abstract: Natural and Social Sciences (*Ilmu Pengetahuan Alam dan Sosial*, IPAS) learning in a Grade 4 class in Central Java, Indonesia, showed a mean end-of-semester score of 59.64 against a learning achievement criterion of 70, and only 8 of 28 students scored above this criterion. Existing Canva-based studies have mostly examined interactive media, infographics, e-comics, and flashcards, so this study developed a Canva-based animated video on cultural diversity and local wisdom and examined its validity, practicality, baseline conditions for effectiveness testing, and student learning activity. The study used research and development with the ADDIE model, and seven validators assessed the product, namely two media experts, two content experts, two language experts, and one IPAS classroom teacher. Twenty-eight students completed a response questionnaire, their pre-test and post-test scores were screened for normality, and classroom observation notes from three days were summarized descriptively. The mean validity score was 90.8%, with media 97.5%, content 83.3%, language 92.5%, and IPAS learning 90.0%, and student responses yielded a practicality score of 92.6%. The video was rated very valid and very practical in this setting, and the content aspect received the lowest and most variable ratings, which indicates where revision attention is most useful. Evidence of learning gains requires a controlled comparison with larger samples, and the findings are preliminary and apply to a single class.

Keywords: animated video; Canva; ADDIE; elementary education; student learning activity; learning outcomes.

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INTRODUCTION

Digital multimedia can support learning by making material easier to follow and learning more enjoyable, as reported by students who used Canva-designed videos (Ilyas et al., 2023). In a quasi-experiment with 257 fifth-grade students, animations with structured textual cues produced higher achievement, better knowledge retention, higher self-efficacy, and lower cognitive load than animations with subtitled or keyword cues (Du et al., 2025). Experiments with whiteboard animations show that progressive drawing and a narrative context were mostly associated with higher learning-relevant variables among secondary school students (Schneider et al., 2023), and related work has examined segmentation, metacognitive prompts, and retention (Krieglstein et al., 2023; Türkay, 2016). Evidence on animation also suggests that its benefits depend on learning goals, design features, and learners' prior knowledge (Arslan-Ari et al., 2020; Ploetzner et al., 2021). Ploetzner et al. (2021) found that animation supported the identification of motion and static pictures supported the identification of spatial arrangements. These findings provide a rationale for examining an animated video designed for a specific topic and group of elementary students.

Studies in elementary education have reported positive findings for animated media. Hanif (2020) found that fifth-grade students taught with motion graphic videos achieved a higher post-test mean than students taught with still pictures (71.72 versus 65.67; $p = .002$). Hapsari et al. (2019) reported improved science learning outcomes following the use of motion graphic animation videos, while Kwangmuang et al. (2024) found that a 3D animated series improved analytical thinking among elementary students in Thailand. These findings support further investigation of animated media in specific subject and classroom contexts.

In Indonesia, *Ilmu Pengetahuan Alam dan Sosial* (IPAS: Natural and Social Sciences) integrates science and social science content in primary education under the *Kurikulum Merdeka*. Studies have examined several Canva-based learning media, including interactive media for Grade 5 IPAS (Nisyaa et al., 2025), science infographics (Ristanti & Isdaryanti, 2024), and e-comics on plastic waste (Kulsum & Isdaryanti, 2024). Caella and Yulianto (2024) examined animated video media in Grade 4 IPAS, while Yuliana et al. (2026) developed Canva-based animated videos about food webs for Grade 5 IPAS. Yuliana et al. (2026) reported validity of 87.07%, varied practicality results across trial groups, and an average N-gain of 0.63. Febrianti et al. (2026) developed Canva-based flashcards on Indonesian cultural diversity for Grade 4 IPAS and reported validity scores of 90% for material, 100% for media, and 95% for language, with practicality scores of 93% to 95% and an increase in mean scores from 54.33 to 87.99 (N-gain = 0.76). These studies provide relevant evidence on Canva-based media and establish useful points of comparison for the present development study.

Student engagement has a behavioral dimension that includes participation, attention, and persistence in the learning environment, and longitudinal studies in elementary schools have linked behavioral engagement with academic achievement

(Bryce et al., 2019; Li et al., 2022). In this study, student learning activity refers specifically to observable participation in learning tasks, questioning, and discussion. This study was motivated by a local learning problem. Observations in a Grade 4 class of a private elementary school in Brebes Regency, Central Java, indicated that some students had not met the expected competencies, student learning activity was low, and the media used rarely matched the lesson. The odd-semester End-of-Semester Summative Assessment (*Asesmen Sumatif Akhir Semester*, ASAS) showed a mean IPAS score of 59.64 against a learning achievement criterion (*Kriteria Ketercapaian Tujuan Pembelajaran*, KKTP) of 70. Of the 28 students, 8 scored above 70, and the remaining 20 scored below this criterion.

The ADDIE model provides a systematic procedure for developing learning media, comprising five stages: Analysis, Design, Development, Implementation, and Evaluation, as demonstrated by Febrianti et al. (2026) in developing Canva-based flashcards on Indonesian cultural diversity for Grade 4 IPAS. Existing studies have primarily examined Canva-based interactive media, infographics, e-comics, and flashcards for IPAS, while research on animated videos has focused on other topics, such as food webs in Grade 5. Limited research has examined Canva-based animated videos for cultural diversity and local wisdom in Grade 4 IPAS, particularly in studies integrating expert validity, student-reported practicality, test scores, and observed learning activity within a single development cycle. This aspect remains underexplored, especially in classrooms where baseline student achievement is below the learning achievement criterion.

This study aims to develop a Canva-based animated video on cultural diversity and local wisdom for Grade 4 IPAS and to examine its validity, practicality, and readiness for effectiveness testing. Based on this aim, the research questions are as follows: 1) How valid is the Canva-based animated video according to media experts, content experts, language experts, and an IPAS learning expert? 2) How practical is the video as indicated by students' responses? 3) What baseline achievement did students show in IPAS, and do their pre-test and post-test scores meet the normality assumption required for evaluating the effectiveness of the video? 4) How did student learning activity develop across three days of implementation?

METHODS

Research design

This study used a research and development (R&D) design based on the ADDIE model: Analysis, Design, Development, Implementation, and Evaluation. The model provides a structured process for developing and refining instructional media (Spatioti et al., 2022). The product was a Canva-based animated video on cultural diversity and local wisdom for Grade 4 IPAS. Data on validity, practicality, test-score distribution, and classroom activity were collected across the five stages.

Figure 1 presents the activities and outputs associated with each ADDIE stage,

from identifying the classroom problem to evaluating the product after implementation.

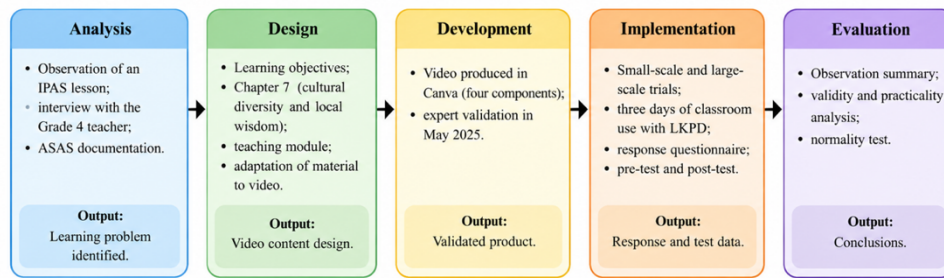


Figure 1. Research Flow Based on the ADDIE Model

Setting and participants

The study was conducted in a private elementary school in Bumiayu District, Brebes Regency, Central Java, Indonesia. The participants were 28 Grade 4 students and their classroom teacher. Seven validators assessed the product in May 2025, namely two media experts (lecturers in information technology), two content experts (IPAS lecturers), two language experts (lecturers in Indonesian language education), and one IPAS learning expert (the classroom teacher). The sample was a single intact class, which defines the scope of the findings.

Table 1 lists the participant groups and their roles in the study. It specifies how many people took part in each group and at which stage they contributed data. The table is included so that readers can see who provided each type of evidence. This information helps readers judge the scope and sources of the findings reported later.

Table 1. Participants and Their Roles

Participant group	n	Role in the study
Grade 4 students	28	Baseline ASAS data, response questionnaire, pre-test and post-test, classroom implementation
Grade 4 classroom teacher	1	Interview informant; IPAS learning expert validator
Media experts (lecturers in information technology)	2	Media validation
Content experts (IPAS lecturers)	2	Content validation
Language experts (lecturers in Indonesian language education)	2	Language validation

The study involved 28 Grade 4 students, their classroom teacher, and seven validators. The students provided baseline, questionnaire, and test data, while the validators assessed the product. The classroom teacher contributed interview data and served as the IPAS learning validator.

Instruments and data analysis

Data were collected through observation, interviews, validation questionnaires, a student response questionnaire, pre-tests and post-tests, LKPD, and documentation. Validity and practicality scores were converted into percentages by dividing the obtained score by the maximum score and multiplying by 100, then interpreted using the study's categories, including very valid, valid, and very practical. Normality of pre-test and post-test scores

was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests in SPSS, which Ghasemi and Zahediasl (2012) described as tests provided and recommended by SPSS for samples smaller than 50. Table 2 maps each data source to its respondents, scoring format, analysis technique, and research question. The validation questionnaires involved seven validators, each with a maximum score of 60, and were analyzed by calculating percentages for each validator, each aspect, and the mean of four aspects to address RQ1. The student response questionnaire involved 28 students, with a maximum total score of 1,680, and was analyzed using the percentage of the total score to address RQ2. ASAS results, pre-test, and post-test scores from 28 students were described against the KKTP criterion of 70 and examined using the Kolmogorov-Smirnov and Shapiro-Wilk tests to address RQ3. Observation notes and interviews with the classroom teacher and class were summarized descriptively by day to address RQ4. This mapping clarifies how each research question was addressed and how the scoring procedures and analyses support interpretation of the results.

RESULTS

Baseline conditions

The Analysis stage identified three problems in the Grade 4 class: some students had not met the expected competencies, student learning activity was low, and the media used rarely aligned with the lesson. The odd-semester ASAS mean for IPAS was 59.64, which was 10.36 points below the KKTP of 70. Of the 28 students, 8 (28.6%) scored above 70 and 20 (71.4%) scored below it.

Table 3 summarizes the baseline achievement data, including the class mean, KKTP, score gap, and number of students above and below the criterion. Figure 2 presents the same data visually, comparing the mean score with the KKTP and showing the distribution of students by criterion attainment.

Table 3. Baseline IPAS Achievement of Grade 4 Students

Indicator	Value
Number of students	28
ASAS mean score	59.64
KKTP (learning achievement criterion)	70
Gap between mean and KKTP	10.36 points below
Students scoring above 70	8 (28.6%)
Students scoring below 70	20 (71.4%)

Table 3 shows that the class mean was 10.36 points below the criterion and that more than seven in ten students scored below it. This pattern indicates that the shortfall affected most of the class. For readers, the table provides a reference point for interpreting any later score change in this class. For teachers and school leaders, it shows concretely why a new medium was considered.

Figure 2 visualizes the baseline data in Table 3. The left panel compares the ASAS mean with the KKTP, and the right panel shows the share of students above and below

the criterion. The figure is included so that the size of the gap can be grasped at a glance. Readers who prefer visual summaries can use it as a quick overview of the problem.

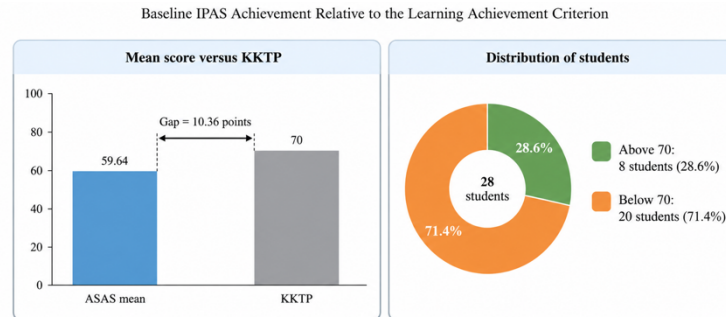


Figure 2. Baseline IPAS Achievement Relative to the Learning Achievement Criterion

Figure 2 shows the class mean falling visibly short of the criterion line and the larger share of students on the below-criterion side. The visual contrast communicates the scale of the gap more quickly than the figures in the text.

Product description

The video developed during the Design and Development stages addressed Chapter 7, cultural diversity and local wisdom. It comprised four components: opening, learning objectives, content, and closing. Canva templates were used for the opening and closing, while animations and text were used in the learning objectives and content sections. The content followed the chapter's established indicators. Figure 3 summarizes the sequence and the Canva features used in each component.

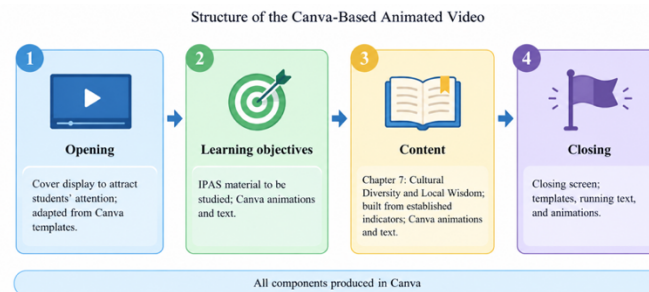


Figure 3. Structure of the Canva-Based Animated Video

Figure 3 shows a linear structure that moves from attention to objectives, content, and closure. It also shows that all components were produced with features available in Canva, such as templates, animations, text, and running text. This transparency helps readers evaluate the content that experts validated and that students used. Teachers who wish to build a similar video can follow the same four-part sequence as a starting template.

Validity

Seven validators assessed the video in May 2025. The mean validity score across the four aspects was 90.8%, classified as very valid. Media received 97.5%, content 83.3%, language 92.5%, and IPAS learning 90.0%. The content ratings showed the largest difference between validators, at 95.0% and 71.7%. Table 4 presents the individual and

aggregated results, indicating that content was the aspect with the lowest overall rating and the greatest variation between reviewers.

Table 4. Expert Validation Results

Aspect	Validator	Score	Maximum score	Percentage	Category
Media	Validator 1	58	60	96.7%	Very valid
Media	Validator 2	59	60	98.3%	Very valid
Media	Total	117	120	97.5%	Very valid
Content	Validator 1	57	60	95.0%	Very valid
Content	Validator 2	43	60	71.7%	Valid
Content	Total	100	120	83.3%	Very valid
Language	Validator 1	53	60	88.3%	Very valid
Language	Validator 2	58	60	96.7%	Very valid
Language	Total	111	120	92.5%	Very valid
IPAS learning	Validator 1	54	60	90.0%	Very valid
Mean of four aspects				90.8%	Very valid

Classroom observation of student learning activity

Classroom observations covered three days of implementation. On the first day, students completed the LKPD, although classroom management was difficult and the atmosphere was less conducive. Conditions improved on the second day, but one student continued to disrupt the class. On the third day, implementation proceeded smoothly, with high enthusiasm and active participation. Table 5 summarizes the observed conditions and classroom management issues across the three days.

Table 5. Classroom Observation Across Three Days of Implementation

Day	Observed condition	Obstacle and response
1	LKPD completion went smoothly; the classroom atmosphere was less conducive	Difficulty managing students; proper adjustments and management kept learning effective
2	LKPD completion went smoothly and improved compared with the first day	One student was difficult to manage and tended to disrupt the class; a more focused classroom management strategy and special attention kept learning effective
3	LKPD completion was very smooth and effective; students showed high enthusiasm and active participation; the researcher monitored learning progress more accurately	No obstacles arose

Practicality

The response questionnaire was completed by 28 students and yielded a total score of 1,555 out of 1,680, equivalent to 92.6%. The mean score was 55.5 out of 60 per student, placing the video in the very practical category. Table 6 reports the total and maximum scores, mean score, percentage, and category.

Table 6. Student Response Questionnaire Results (N = 28)

Aspect	Total score	Maximum score	Mean per student	Percentage	Category
Overall	1,555	1,680	55.5 of 60	92.6%	Very practical

The very practical category indicates that students responded positively to the video as a learning medium. Presenting the raw scores lets readers verify the percentage and compare it with percentages from other studies. For teachers, the result offers encouraging evidence about student acceptance before deciding to use the video.

DISCUSSION

Validity of the video

The video obtained a mean validity score of 90.8%, with media receiving the highest rating (97.5%) and content the lowest (83.3%). The high media rating is consistent with the use of Canva's graphic and animation features described by Yuliana et al. (2026) and with reports that Canva-designed videos made learning material easier to understand (Ilyas et al., 2023). However, content ratings varied between validators, at 95.0% and 71.7%. This difference may reflect varying expectations about the representation of cultural diversity and local wisdom, although the validators' written comments were not analyzed in this study.

The results can be considered alongside those of Yuliana et al. (2026), who reported 87.07% validity for Canva-based animated videos on food webs, and Febrianti et al. (2026), who reported validity scores of 90% for material, 100% for media, and 95% for language in a study of Canva-based flashcards. Comparisons should be interpreted cautiously because the instruments, validators, and topics differed. The relatively low content rating in the present study indicates that content review and documented revisions remain important, because experimental studies have examined how the cueing, segmentation, and guidance of animated content relate to learning outcomes (Arslan-Ari et al., 2020; Du et al., 2025; Krieglstein et al., 2023; Wang et al., 2020).

Practicality of the video

Students' responses yielded a practicality score of 92.6%, with a mean of 55.5 out of 60 points per student. Du et al. (2025) found that fifth-grade students who learned from animations with structured textual cues showed higher self-efficacy and the lowest cognitive load, and Schneider et al. (2023) reported that a narrative context in whiteboard animations was mostly associated with higher motivational, cognitive, and affective variables among secondary school students. These findings offer possible explanations for the favorable responses if the video combined animation with structured text and a coherent narrative sequence. However, the questionnaire did not measure these mechanisms.

The practicality score is comparable to results reported by Nisyaa et al. (2025), who found student response scores of 97.77% and 97.08% in small-group and large-group trials, and Febrianti et al. (2026), who reported scores of 93% to 95% across three schools. Yuliana et al. (2026) reported 97.33% in individual trials and 74.40% in small-group trials. Differences may reflect group size, implementation conditions, or questionnaire content. Because the present study relied on student responses, future evaluations could

also include teacher-reported practicality, since earlier work on Canva-designed videos focused on students' perceived ease of use and convenience (Ilyas et al., 2023).

Baseline achievement and readiness for effectiveness testing

The class mean was 10.36 points below the KKTP, with 71.4% of students scoring below the criterion, while Shapiro–Wilk tests indicated normality for pre-test ($p = .053$) and post-test ($p = .279$) scores, although the pre-test result warrants cautious interpretation given the small sample. Previous studies reported improved learning outcomes following the use of motion graphic videos (Hanif, 2020; Hapsari et al., 2019), Canva-based flashcards (Febrianti et al., 2026), and 3D animated learning media (Kwangmuang et al., 2024), while Du et al. (2025) found that structured textual cues in educational animations supported achievement and knowledge retention among fifth-grade students. In the present study, the animated video was used alongside the LKPD and classroom activities, so a paired comparison of pre-test and post-test scores, including an effect size, would help evaluate changes in achievement. These findings should be interpreted in consideration of differences in research design, learning topics, test difficulty, and intervention duration.

Student learning activity

Student observations indicated improved classroom management, enthusiasm, and active participation over the three implementation days, consistent with the behavioral dimension of engagement involving participation, attention, and persistence (Li et al., 2022). Hanif (2020) reported greater student activity and concentration when using motion graphic videos, while Bryce et al. (2019) linked behavioral engagement and instructional support to reading and mathematics achievement. The observed progression may have been associated with students' familiarity with the LKPD routine and video, as well as changes in classroom management, although the observation notes could not distinguish these influences. Future studies could employ validated observation instruments with scored indicators across multiple time points to quantify changes in student learning activity (Li et al., 2022).

Limitations and future research

This study involved one class of 28 students, one topic, and three days of implementation, limiting the generalizability of the findings. It did not include a comparison group or delayed post-test. Practicality was assessed through student self-reports, while learning activity was described using observation notes. Future research could use a quasi-experimental design with a control class and assess retention after several weeks, as in Du et al. (2025), examine additional IPAS topics, collect teacher feedback on practicality, and measure learning activity with a validated engagement instrument.

CONCLUSION

A Canva-based animated video on cultural diversity and local wisdom was developed for Grade 4 IPAS using the ADDIE model. The video received a mean validity score of 90.8% and a student-reported practicality score of 92.6%. Content received the lowest

overall validity rating (83.3%) and showed the greatest difference between validators, indicating an aspect for further review. Pre-test and post-test scores met the normality assumption, while classroom observations recorded high student participation on the third day. The class's baseline mean was below the KKTP, providing a rationale for further evaluation. Because the study involved one class without a comparison group, the findings describe the product's validity, perceived practicality, score distribution, and observed classroom activity. Controlled studies with larger samples and additional topics are needed to examine effects on learning outcomes.

AI Use Statement

AI-assisted tools were used, if applicable, to improve language clarity and readability. The authors reviewed the manuscript and take responsibility for its content.

Author Contributions

SK: led the research, developed the learning media, and drafted the manuscript. YS: contributed to research methodology and manuscript review. AA; DAR: contributed to data collection, validation, and analysis. ELYT: contributed to critical feedback and manuscript revision. All authors approved the final manuscript.

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Conflict of Interest

The authors declare no competing interests.

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