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The Effectiveness of Canva-Assisted Audiovisual Media in Improving Elementary School Students' Learning Outcomes on the Topic of Climate and Its Changes

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Abstract: This study aims to develop and examine the effectiveness of a Canva-assisted audiovisual learning medium on the topic of Climate and Its Changes in elementary schools. The research employed a research and development (R&D) method using the ADDIE model, which consists of the stages of analysis, design, development, implementation, and evaluation. The research subjects were 30 fourth-grade students from SD Negeri Rantau Pangeran and SD Negeri Talang Nyamuk. The resulting product was an interactive video that combines text, animation, images, and audio to visualize abstract climate concepts. Expert validation results indicated a very high level of validity with an average score of 92.80%, covering aspects of media, material, and language. The practicality test obtained scores ranging from 76% to 100%, categorized as practical to very practical. The effectiveness test showed a significant improvement in students' learning outcomes, as evidenced by an increase in the average pretest score from 54.67 to 82.33 in the posttest, with an N-Gain value of 0.63 (moderate category). These findings demonstrate that the Canva-assisted audiovisual medium is feasible to be used as an alternative for science learning, as it can enhance conceptual understanding, scientific skills, science literacy, and learning motivation among elementary school students.

Keywords: Audiovisual media; Canva; Climate and its changes; Learning outcomes; Science literacy

Introduction

Primary education serves as the fundamental foundation for human resource development, as it is at this stage that children begin to acquire basic concepts of knowledge, attitudes, and skills that will prepare them to face future life challenges (Wulandari et al., 2023). Within the elementary school curriculum, one of the subjects that plays a vital role in shaping students' understanding of nature and the environment is Natural Science (IPA) (Hilmiyati et al., 2024). Science education not only focuses on delivering scientific concepts but also emphasizes how students can think critically and systematically while developing scientific skills that support their understanding of real-world phenomena (Çeken & Taşkın, 2022). One of the most complex science topics to teach at the elementary level is climate and its changes, making it a key focus of educational research (Nepraš et al., 2022). This topic requires solid conceptual understanding since climate differs from weather, which can be observed daily — climate refers to long-term patterns of weather and statistical conditions of the atmosphere, whereas weather represents short-term conditions. Scientific literature on climate change and

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weather variability clearly explains these differences in time and scale. Climate encompasses long-term weather patterns influenced by physical factors such as geographical location, topography, ocean currents, and anthropogenic factors (greenhouse gas emissions and other human activities) that alter energy and global climate circulation systems.

Climate change, as a current global issue, also requires students to understand its impacts on life — such as the rise in global average temperature, melting of polar and glacial ice, changes in rainfall patterns, and disruptions to ecosystems and biodiversity (Abbass et al., 2022). The complexity of this topic often poses difficulties for elementary students because of its abstract nature, which requires visualization or concrete media to help them grasp long-term processes and large-scale phenomena. Educational literature has emphasized the importance of learning strategies and media (including multimedia) specifically designed for this level (Tani et al., 2022). These learning challenges affect students' cognitive learning outcomes. Cognitive learning outcomes refer to students' knowledge-related abilities, including remembering, understanding, applying, analyzing, and evaluating learned information. In the context of the climate and its changes topic, students are expected not only to memorize definitions but also to comprehend interrelated concepts, apply their understanding to real-life situations, and analyze the impacts of climate change on their surroundings. If instruction relies solely on conventional methods such as lectures or textbook reading, students may struggle to achieve optimal cognitive results due to limited experience, low engagement, and the complexity of climate concepts, which are inherently systemic.

Ranney et al. (2021) emphasize that "climate change understanding is hindered when instruction relies solely on passive information delivery, whereas diverse, interactive information chunks can significantly enhance cognitive acceptance of global warming." This finding aligns with (Tang, 2025) study on Indonesian high school students, which revealed that "adolescents often demonstrate fragmented climate conceptions across cognitive, affective, and behavioral dimensions, with cognitive understanding lagging behind affective concern." These conditions highlight the need for learning approaches that integrate cognitive, affective, and contextual aspects so students can develop comprehensive and applicable scientific representations. Similarly, Instructional Practices in K–12 Climate Change Education Across New Jersey Classrooms by Madden et al. (2025) stresses that "active, inquiry-based, and locally relevant instructional practices help students connect abstract climate concepts to their daily experiences, fostering deeper cognitive engagement and retention." Beyond the cognitive domain, science learning also requires the development of students' scientific skills.

Scientific skills refer to a set of science process skills, including observing, classifying, measuring, interpreting data, asking questions, and drawing conclusions based on evidence. These skills are crucial to be instilled from an early age to foster critical, analytical, and systematic thinking patterns in addressing real-life problems. Research published in the Journal of Science Education Research shows that the use of inquiry-based teaching materials integrated with local wisdom can improve students' observation, classification, and inference skills. Furthermore, the implementation of group investigation-based learning provides opportunities for students to formulate questions, perform measurements, and draw evidence-based conclusions, significantly improving their scientific skills. The use of Android-based learning media has also proven effective in enhancing science process skills, as it allows students to observe, record, and analyze data more interactively. Despite these positive findings, many classroom practices still emphasize rote memorization of concepts, which hinders the optimal development of students' scientific skills.

Preliminary observations conducted at SD Negeri Rantau Pangeran and SD Negeri Talang Nyamuk revealed that science learning, particularly on the topic of climate and its changes, is still dominated by conventional teaching methods such as lectures and textbook-based learning. Teachers rarely utilize varied learning media, especially audiovisual media that could help visualize the content. As a result, many students find it difficult to distinguish between the concepts of weather and climate and to comprehend the abstract impacts of climate change. Observations also showed that most students tend to be passive, less enthusiastic in asking questions, and struggle to relate the learned concepts to real-life phenomena. This condition negatively affects cognitive learning outcomes and limits the development of scientific skills such as observing, interpreting data, and drawing conclusions. These findings highlight the need for developing audiovisual-based learning media—especially using digital platforms—to enhance student engagement, conceptual understanding, and scientific skill development.

To address these challenges, innovation in teaching strategies through the use of audiovisual media is required. Audiovisual media are advantageous because they combine visual elements (images, graphics, animations, videos) with audio elements (sound, narration, music), enabling the learning message to be delivered in a more concrete, engaging, and understandable manner. Research published in the

Journal of Science Education Research indicates that the use of instructional videos significantly improves students' learning outcomes and interest in learning science (Caella & Yulianto, 2024). Similarly, guided inquiry learning models integrated with scientific attitudes have been proven to enhance students' science process skills by training them to observe, discuss, and interpret phenomena actively (Hasmawati et al., 2023). Other studies have also found that the development of interactive video-based learning media effectively visualizes abstract science concepts, attracting and sustaining students' attention and learning motivation (Jufrida et al., 2024). Such audiovisual presentations make complex information more tangible, increase learning appeal, facilitate comprehension, and strengthen memory retention.

In practice, the development of audiovisual media has become more accessible with the emergence of various digital platforms, one of which is Canva. Canva is a digital graphic design application that enables teachers to create instructional materials in the form of presentations, videos, or posters with visually appealing designs. Its strengths lie in its user-friendly features, wide range of templates, icons, illustrations, and animations relevant to educational needs. The use of Canva has proven effective in enhancing teachers' creativity and students' learning motivation, as it allows for greater creative freedom in designing interactive learning media. Moreover, the use of digital-based audiovisual media helps students understand abstract science concepts through more concrete visualization and audio (Putra et al., 2024). Integrating Canva into the learning process also provides enjoyable learning experiences and assists teachers in developing materials suited to students' characteristics (Ristanti & Isdaryanti, 2024). With Canva, teachers can design audiovisual media that align with elementary students' cognitive development levels while simplifying abstract concepts into more comprehensible visual representations (Sumartiwi & Ujianti, 2022).

The use of Canva-assisted audiovisual media not only improves cognitive learning outcomes but also supports the development of students' scientific skills. By visualizing climate phenomena, students are encouraged to observe patterns, test simple hypotheses, compare evidence, and draw conclusions based on animated data displays—activities that enrich the cognitive domain while fostering scientific thinking. Several studies and reports on Canva implementation have demonstrated these practical benefits. Rahman et al. (2023) explain that animation and video templates in Canva simplify the presentation of abstract concepts, enhancing comprehension (Febriana et al., 2024) show that Canva-based learning media improve teachers' creativity in elementary schools, and Alfian et al. (2022) report that Canva application training for early childhood educators (HIMPAUDI Mustika Jaya) effectively increased participants' engagement and appreciation for audiovisual learning materials.

Given the strong connection between Canva-assisted audiovisual media, cognitive learning outcomes, scientific skills, and the complexity of climate and its changes, this research on media effectiveness is essential. Studies on audiovisual media development in the context of elementary science learning indicate that such media clarify abstract concepts, improve learning mastery, and encourage scientific inquiry (Mubarok, 2022). Therefore, testing the effectiveness of Canva-based audiovisual media at SDN Rantau Pangeran and SDN Talang Nyamuk is relevant—not only to add empirical evidence but also to provide practical guidance for teachers on designing materials that enhance conceptual understanding and science process skills. Furthermore, this research reinforces the role of digital technology in elementary science education while equipping students with strong conceptual understanding and essential scientific skills to face future global challenges.

Method

Type of Reseach

This research is a type of Research and Development (R&D) study that employs the ADDIE development model, consisting of the stages of analysis, design, development, implementation, and evaluation (Purba et al., 2025). The ADDIE model is one of the most widely used frameworks in instructional design because it offers a systematic and structured process. Its strength lies in providing clear guidance from planning to evaluation, ensuring that the resulting learning product is effective, efficient, and aligned with students' needs. In addition, the ADDIE model is flexible and can be adapted to various contexts and types of learning media, including the development of audiovisual media assisted by Canva, thus supporting the creation of engaging and meaningful learning experiences for students.

Subjects, Objects, and Research Location
The subjects in this study were all fourth-grade students of State Elementary School (SDN) Rantau Pangeran, totaling 15 students, and students from SDN Talang Nyamuk, located in Dusun VI, Muara Medak Village, totaling another 15 students. Thus, the total number of students involved as research subjects was 30. The object of this research refers to the main focus of analysis aimed at obtaining a deeper understanding of the phenomenon under study. In this research, the object analyzed was an interactive video containing learning materials about climate and its changes.

Research Prosedure

Table 1. Research Procedures

ADDIE Stage	Main Focus	Activities
Analysis	Needs and context analysis	Conducting teacher interviews, observing students' understanding, and identifying media needs
Design	Media and instrument design	Creating a Canva storyboard and preparing assessment instruments
Development	Media and instrument production and validation	Developing the Canva video and conducting validity testing
Implementation	Learning implementation and data collection	Administering pretest → conducting learning activities → administering posttest
Evaluation	Result analysis and methodological reflection	Analyzing N-Gain scores, reviewing learning objectives, and reflecting on relevant literature

Data Analysis

The data processing procedure was carried out according to the type of data obtained. Data from observations and interviews were processed and presented in a descriptive form to support and strengthen the quantitative data obtained from questionnaires. Meanwhile, the questionnaire data were primarily analyzed using a Likert scale, with the following calculation formula:

Table 2. Likert Scale Rating Level

Category	Score
Very Good	5
Good	4
Neutral	3
Poor	2
Very Poor	1

The data from the validation sheets filled out by the experts were averaged using the following formula:

$$X = \frac{\text{Total Score}}{\text{Ideal Score Total}} x100\% \quad (1)$$

Then, the results were categorized according to the predetermined criteria, as shown below:

Table 3. Rating Criteria

Level (%)	Category	Category	Category
0 - 20	Very Disagree	Very Invalid	Very Inpractice
21 - 40	Disagree	Invalid	Inpractice
41 - 60	Neutral	Enough	Enough
61 - 80	Agree	Valid	Practice
81 - 100	Very Agree	Very Valid	Very Practice

Meanwhile, for the test results, the N-Gain score was calculated using the following formula:

$$N_{gain} = \frac{S_{posttest} - S_{pretest}}{S_{maximum} - S_{pretest}} \quad (2)$$

Explanation:
N-Gain = Normalized gain score
S_{pretest} = Average pretest score
S_{posttest} = Average posttest score
S_{maximum} = Maximum possible score

The level of the N-Gain value can be classified as follows:

Table 4. N-gain Score Criteria

N gain Score	Category
> 0.70	High
> 0.30 <0.70	Middle
<0.30	Low

Result and Discussion

Media Development Result

The product developed in this research is an audiovisual learning medium assisted by Canva, focusing on the topic "Climate and Its Changes." This medium combines images, animations, text, and voice narration arranged systematically to help students better understand abstract concepts related to climate. The content sequence begins with an introduction to climate elements (temperature, rainfall, wind, humidity), an explanation of factors causing climate change, and a discussion of the impacts of climate change on human daily life.

Figure 1. User interface

Figure 2. Main menu display

Figure 3. Example of learning material display

The figures above illustrate examples of the developed product. The product was created using Canva and referred to as a prototype, which then underwent a series of expert validation tests before proceeding to the next development stages. The validation process was carried out across three key aspects: Media, Language, and Content (Material). The results of the expert validation are presented in Table 5.

Table 5. Recapitulation of Expert Validation Result

Expert Validation	Score (%)	Category
Media	93.50	Very Valid
Content	94.90	Very Valid
Language	90.20	Very Valid
Average Score	92.80	Very Valid

The validation results conducted by experts indicate that the developed learning media falls within the "Very Valid" category, with an average score of 92.80%. The validation covered three main aspects—media, content, and language—each assessed by specialists in their respective fields. The media aspect obtained a score of 93.50%, suggesting that the visual design, layout, animations, audio, and interactive elements met quality standards and are suitable for classroom use. The content aspect received the highest score of 94.90%, reflecting that the learning materials align with the curriculum, learning objectives, and scientific principles. The materials are systematically structured and relevant to students' needs. Meanwhile, the language aspect scored 90.2%, indicating that the language used in the video is communicative, informative, and appropriate for the students' comprehension level—though minor refinements were suggested regarding sentence effectiveness and stylistic consistency.

Despite receiving very satisfactory ratings from all experts, the product underwent several revisions and improvements that significantly enhanced its design compared to the initial prototype. The content expert highlighted adjustments related to the formulation of Learning Objectives (CP and TP) to better align with the curriculum, ensuring material balance, appropriate sequencing, and inclusion of more student activities to facilitate understanding. The language expert recommended replacing or clarifying unfamiliar scientific or foreign terms for the target learners. In response, a glossary button was added to help students easily find the meanings of difficult words. Finally, the media expert suggested major technical refinements, including adjustments to color composition, transparency, layout, and visual balance, which led to substantial improvement in the overall product quality.

Based on these revisions and expert recommendations, it can be concluded that the developed audiovisual learning media meets the feasibility criteria in terms of visual design, content accuracy, and linguistic clarity. Therefore, the product is deemed suitable for classroom use and has the potential to enhance the effectiveness of learning delivery through audiovisual approaches.

Media Practicality

In addition to expert validation, the Canva-assisted audiovisual learning media developed in this study was also tested for practicality, to ensure its ease of use by both teachers and students during the learning process. Practicality testing is an essential stage in development research aimed at assessing the extent to which a product can be used, understood, and applied by its intended users without requiring special assistance or training. The practicality test was measured using statements and indicators related to ease of use. As noted by Tunnisa et al. (2022) examples of practicality aspects in instructional materials include content feasibility, language clarity, and design quality.

In this study, the practicality test was conducted through a small-group trial involving a classroom teacher and several students as the initial users of the product. The small-group trial is considered effective for obtaining direct feedback from users on a limited scale before the media is implemented in a larger field test (Lawhon, 1976). During this stage, the teacher used the media independently during the lesson, while students

observed, interacted, and provided assessments regarding the ease of understanding the material, visual appeal, and clarity of menu navigation. This approach allowed the researcher to identify early technical issues such as operational difficulties, unclear instructions, or device compatibility problems. The results of the media practicality test are shown in Table 6.

Table 6. Practicality Test Results

Assessment aspects	Learners						
	AW	JS	BP	NM	RRA	TAS	UZ
The video helped me understand climate change more easily.	4	3	4	5	4	5	4
I can watch the video multiple times until I truly understand it.	4	4	5	5	5	5	5
I can learn from the video at school and at home.	3	3	4	3	5	5	4
Difficult material becomes easier after watching this video.	4	4	4	5	4	5	4
The images and animations in the video make me excited to learn.	5	5	5	5	5	5	5
Total	20	19	22	23	23	25	22
Ideal Score	25	25	25	25	25	25	25
Practicality Score	80%	76%	88%	92%	92%	100%	88%
Description	Practical	Practical	Very Practical	Very Practical	Very Practical	Very Practical	Very Practical

Based on the assessment results from seven students, it was found that the video-based learning media greatly facilitated the learning process, especially in understanding the topic of climate and its changes. For the ease of understanding aspect, most participants gave high scores ranging from 3 to 5. Two students, NM and TAS, gave the highest score (5), indicating that the explanations in the video significantly improved their understanding. The ability to replay the video as many times as needed also received excellent feedback, with all students giving high ratings—five of them giving perfect scores (5)—demonstrating that the replay feature was highly beneficial for reinforcing comprehension. In the flexibility of learning location aspect (school or home), several students (AW, JS, NM) gave scores of 3, suggesting possible limitations in access or comfort depending on the environment. However, the other students rated this aspect quite well (4–5). For the simplification of difficult material, the ratings ranged from 4 to 5, showing that the video helped students grasp previously challenging concepts. Finally, for the visual and animation quality, all students gave the highest score (5), confirming that the graphics and animations in the video successfully increased motivation and engagement. Overall, total scores ranged from 19 to 25 out of a maximum of 25, resulting in practicality levels between 76% and 100%. Five out of seven students rated the video as "Very Practical." These findings confirm that the Canva-assisted video learning media not only enhances material comprehension and enables flexible learning but also captures students' attention through appealing visuals. Therefore, the media is considered highly practical and suitable for use in classroom learning activities.

Effectivenes media in Student Learning Outcome

The effectiveness test was conducted to evaluate the extent to which the Canva-assisted audiovisual learning media improved students' understanding, motivation, and engagement in the topic "Climate and Its Changes." This activity involved 30 fourth-grade students from SDN Rantau Pangeran and SDN Talang Nyamuk as respondents. Through a field test, the researcher obtained real evidence of the media's impact on learning outcomes, visual appeal, and content comprehension, which also served as the basis for product refinement before broader implementation. The procedure began with a pretest consisting of 10 multiple-choice questions aligned with the learning indicators, aimed at measuring students' prior knowledge. Students then participated in lessons using the developed video-based learning media. Afterward, a posttest of equal difficulty was administered to determine the improvement in comprehension after the learning intervention.

Table 7. Rekapitulasi Hasil Pretest

Score	Number of Student	Percentage (%)	Category
81-100	0 Student	0	Very Good
61-80	11 Student	36.67	Good
41-60	10 Student	33.33	Enough
21-40	6 Student	20	Poor
0-20	3 Student	10	Very Poor
Total	30 Student		

The pretest results show that none of the students scored within the 81–100 range, meaning that no student had yet achieved the Very Good category. This indicates that students' understanding of the material was still relatively limited before using the learning media. The "Good" category (61–80) was achieved by 11 students (36.67%), representing the highest proportion. This suggests that some students already had a moderate grasp of the topic, though improvement was still needed. Meanwhile, 10 students (33.33%) were in the "Fair" category, meaning about one-third of the students still required additional guidance and more interactive teaching strategies to reach higher achievement levels. Furthermore, 6 students (20%) were categorized as "Poor", and 3 students (10%) as "Very Poor", highlighting gaps in understanding that warranted further intervention such as remedial instruction or personalized support. Following the pretest, the learning process continued with the use of the Canva-based audiovisual media. After completing the lesson, students took the posttest, with results summarized below.

Table 8. Posttest Results Summary

Score	Number of Student	Percentage	Category
81-100	14 Student	46.67	Very Good
61-80	13 Student	43.33	Good
41-60	0 Student	0	Enough
21-40	0 Student	0	Poor
0-20	0 Student	0	Very Poor
Total	30 Student		

Based on the posttest results, there was a significant improvement in students' understanding after learning with the video media. Out of 30 students, 14 students (46.67%) achieved scores in the Very Good category (81–100), showing that nearly half of the class had mastered the material at an excellent level. Meanwhile, 13 students (43.33%) fell into the good category (61–80), indicating that most students had achieved satisfactory comprehension of the content. Importantly, no students scored below 61, meaning that all participants achieved at least a good level of mastery. This result clearly demonstrates the effectiveness of the media in enhancing learning outcomes and ensuring more equitable comprehension across the class. Overall, the findings suggest that the learning process using Canva-assisted media was highly effective in improving students' academic performance. However, continued efforts are still necessary to maintain and further enhance these results to ensure consistent long-term learning achievement.

Analysis of the pretest and posttest results revealed a notable increase in scores after the learning intervention. The average pretest score was 54.67, which rose to 82.33 in the posttest. This improvement indicates that most students showed meaningful progress in understanding the material. The highest posttest score reached 100, while the lowest was 70, confirming that all students achieved satisfactory outcomes. To assess the learning effectiveness more objectively, the N-Gain was calculated. The average N-Gain score was 0.63, which falls under the medium category. This suggests that the applied learning media had a positive and moderately strong impact on students' learning outcomes, though further improvements could help elevate effectiveness to the High category.

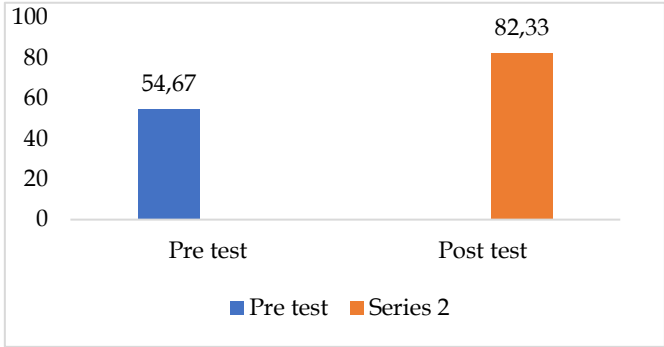

Figure 4. Avarege pretest and posttests score

Specifically, 13 students (43.30%) achieved a High N-Gain, meaning they showed very significant improvement; 16 students (53.30%) were in the medium category, showing moderate improvement; and 1 student (3.30%) fell into the Low category, whose score remained unchanged between pretest and posttest. From these results, it can be concluded that the majority of students demonstrated notable learning progress after using the media. Teachers can maintain the effective strategies already applied while giving additional attention to students with lower improvement levels. With continued refinement and adaptive teaching methods, all students are expected to achieve optimal learning outcomes in future lessons.

Discussion

The results of this study indicate that the Canva-assisted audiovisual media developed is highly valid, practical, and effective in improving students' understanding of the topic *Climate and Its Changes*. This finding aligns with Azizah et al. (2025) and Rahayu et al. (2025) who found that using Canva in developing science learning media can enhance visual quality and help teachers organize materials more systematically. Similarly, studies by Anggraeni (2025) confirmed that Canva-based media possess high flexibility and can create visually engaging learning materials that increase elementary students' motivation. These findings reinforce that Canva effectively integrates text, images,

animations, and audio to support the learning process. From a theoretical perspective, the effectiveness of this media can be explained by Mayer (2024), Cognitive Theory of Multimedia Learning which posits that presenting information simultaneously through visual and auditory channels enhances cognitive processing capacity and strengthens concept retention.

Consistent with this theory Mou (2023) and Caella et al. (2024) reported that the use of animation in science media increases elementary students' attitudes and understanding of abstract concepts. Likewise, studies by Putri et al. (2024) and Zakirman et al. (2022) demonstrated that combining audio, text, and animation in learning media plays a crucial role in improving comprehension of scientific content. In this study, the integration of voice narration, dynamic illustrations, and textual explanations helped students build stronger mental representations of climate concepts, as evidenced by the increase in the average posttest score from 54.67 to 82.33. The practicality of the media also contributes significantly to learning effectiveness. Results from the small-group trials show that the practicality rate reached 76–100%, with most students rating the media as "very practical." These findings are consistent with who reported a practicality score of around 85% (highly practical category). Similarly, Studied by Yanti et al. (2025) as well as found that audiovisual learning media are easy to access, simple to operate, and receive positive responses from both teachers and students.

In terms of learning effectiveness, the N-Gain score of 0.63 obtained in this study indicates an improvement in students' understanding within the moderate category. This finding is consistent with previous literature and empirical studies that have reported an increase in N-Gain following the use of audiovisual media in elementary schools. For instance, a review conducted by on the use of audiovisual media in science learning at the elementary level found a positive impact on learning outcomes. Similarly, an experimental study by who developed an animated video (Powtoon), reported an N-Gain of approximately 0.68 (moderate category) after implementing the animation-based learning in elementary classrooms. Nevertheless, the fact that some students only achieved a moderate N-Gain category indicates there is still room for improvement in the instructional design.

Literature on interactive multimedia suggests that incorporating interactive elements—such as formative quizzes within videos, reflection activities, or interactive e-modules—can enhance cognitive engagement and positively influence N-Gain. For example, research on interactive e-modules reported an N-Gain of around 0.51 and demonstrated a strong correlation between students' responses to interactive multimedia and improvements in learning outcomes, supporting the recommendation to include quizzes or reflective activities in the developed media (Alyusfitri et al., 2024). In terms of learning effectiveness, the N-Gain score of 0.63 indicates a significant improvement in students' understanding within the moderate category. This finding is consistent with the study Climate Change Interactive Teaching Materials to Enhance Students' Critical Thinking Skills and Science Attitude (Pursitasari et al., 2023), which reported that the use of interactive teaching materials on climate change produced a higher N-Gain in experimental classes compared to control groups, as well as enhanced scientific attitudes and critical thinking skills.

Similarly, the research Development of STEM Animation Learning Media with Feedback to Facilitate Students' Critical Thinking Ability on Global Warming Materials by Lafifa et al. (2022) supports that STEM-based animated media with feedback is highly effective in strengthening students' understanding of abstract scientific concepts and improving their cognitive abilities. Since some students still achieved a moderate N-Gain category, the learning design could be further improved by integrating interactive quizzes or reflection activities based on real-world phenomena such as climate or weather changes. These enhancements would further strengthen students' scientific literacy, particularly their ability to interpret evidence and draw data-based conclusions (Qiao et al., 2024; Berndt et al., 2021).

Overall, the findings of this study confirm that audiovisual media developed using Canva can serve as an adaptive, accessible, and relevant alternative learning tool for elementary school students. Supported by multimedia learning theory, empirical evidence from related studies, and the contextual connection of the material to global issues such as climate change, this media not only improves learning outcomes but also fosters 21st-century skills—including digital literacy, learning autonomy, and environmental awareness.

Conclusion

This study demonstrates that audiovisual media developed using Canva is feasible to be used as a learning medium for the topic Climate and Its Changes in elementary schools, as it meets the criteria of being valid, practical, and effective. The validity of the media is supported by expert validation results, which confirm the appropriateness of its content, design, and presentation. Its practicality is evident through ease of use and positive responses from both teachers and students. The effectiveness of the media is reflected in the significant improvement of learning outcomes, shown by a higher average post-test score and an N-Gain value of 0.63 (moderate category). The presentation

of materials through a combination of text, animation, images, and audio aligns with the Cognitive Theory of Multimedia Learning, thereby enhancing comprehension and retention of scientific concepts. Beyond improving students' understanding of climate concepts, this media also contributes to strengthening scientific literacy. The visualization of climate change phenomena encourages students to connect scientific concepts with real-world events, interpret data, and develop critical thinking skills. The growth of scientific literacy through this media not only equips students with factual knowledge but also fosters their ability to make evidence-based decisions when facing global environmental issues. With its accessibility and flexibility, Canva-based audiovisual media serves as a relevant learning alternative for the 21st century, promoting digital literacy, scientific literacy, independent learning, and environmental awareness for sustainability.

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