



Development of science literacy-based animated video media for IPAS

Clara Lapebridinsi¹, Dea Mustika²

^{1,2}Universitas Islam Riau, Kota Pekanbaru, Riau

claralapebridinsi@student.uir.ac.id¹, deamustika@edu.uir.ac.id²

ABSTRACT

The lack of engaging learning media is one of the obstacles in the teaching and learning process, which affects students' low learning outcomes. This study aims to develop a science literacy-based animated video media for the Natural and Social Sciences (IPAS) subject in Grade IV at SDN 006 Pangkalan Indarung, Kuantan Singingi Regency. This research is a type of Research and Development (RnD) using the ADDIE development model. The research subjects included six validators consisting of two material experts, two language experts, and two design experts, as well as one teacher and six fourth-grade students. Data collection techniques involved validation sheets and response questionnaires, which were then analyzed using qualitative and quantitative methods. The validation results from all six validators indicated that the science literacy-based animated video media is highly valid in terms of content, language use, and visual design. In addition, responses from the teacher and students showed that the media is engaging, easy to understand, communicative, and relevant to the IPAS subject matter. Therefore, it can be concluded that this media is feasible to be used as a learning support tool that can enhance student engagement and understanding.

ARTICLE INFO

Article History:

Received: 1 Apr 2025

Revised: 17 Jul 2025

Accepted: 20 Jul 2025

Available online: 8 Aug 2025

Publish: 29 Aug 2025

Keywords:

animated video media; scientific literacy; IPAS

Open access

Inovasi Kurikulum is a peer-reviewed open-access journal.

ABSTRAK

Kurangnya media pembelajaran yang menarik menjadi salah satu kendala dalam proses belajar mengajar, yang berdampak pada rendahnya hasil belajar peserta didik. Penelitian ini bertujuan mengembangkan media video animasi berbasis literasi sains pada mata pelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS) kelas IV SDN 006 Pangkalan Indarung, Kabupaten Kuantan Singingi. Penelitian ini merupakan penelitian Research and Development (RnD) dengan menggunakan model pengembangan ADDIE. Subjek dalam penelitian ini meliputi enam validator yang terdiri atas dua ahli materi, dua ahli bahasa, dan dua ahli desain, serta satu guru dan enam peserta didik kelas IV. Teknik pengumpulan data menggunakan lembar validasi dan angket respon, yang kemudian dianalisis secara kualitatif dan kuantitatif. Hasil validasi dari keenam validator menunjukkan bahwa media video animasi berbasis literasi sains dinyatakan sangat valid dari segi isi materi, penggunaan bahasa, dan desain visual. Selain itu, respon guru dan peserta didik menunjukkan bahwa media ini menarik, mudah dipahami, komunikatif, dan relevan dengan materi IPAS. Oleh karena itu, dapat disimpulkan bahwa media ini dinilai layak digunakan sebagai sarana pendukung pembelajaran yang mampu meningkatkan keterlibatan dan pemahaman peserta didik.

Kata Kunci: media video animasi; literasi sains; IPAS

How to cite (APA 7)

Lapebridinsi, C., & Mustika, D. (2025). Development of science literacy-based animated video media for IPAS. *Inovasi Kurikulum*, 22(3), 1619-1634.

Peer review

This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

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INTRODUCTION

Education has a role in shaping the foundation of students' knowledge, attitudes, and skills. Education enables individuals to experience the development of attitudes and behaviors in a more positive direction. Quality education can provide learning experiences that foster optimal intellectual, emotional, and social growth (Arifin, 2020; Khaira *et al.*, 2023). One measure undertaken by the government to improve the quality of education is the implementation of the Merdeka Curriculum. The Merdeka Curriculum provides greater space for students to develop their potential in accordance with their characteristics and needs. In the Merdeka Curriculum, attention is focused on essential content so that students have adequate opportunities to understand concepts and develop their abilities (Wahyudi *et al.*, 2023). Students are not only required to master the material but also to apply it in their daily lives.

The implementation of the Merdeka Curriculum aims to improve the quality of learning; one approach is to apply technology-enhanced learning models. Learning media function as tools or techniques to facilitate the transfer of knowledge from teachers to students (Shela & Mustika, 2023). Developments in the fields of science, technology, and the arts require teachers to use technology, information, and communication effectively. Rapid technological development presents various benefits and advantages in the field of education. Technology can be utilized as an attractive and innovative learning medium (Rosyiddin *et al.*, 2023). Therefore, to improve the quality of education, teachers need to keep up with technological developments, including skills in designing and using technology-based learning media. Teachers can utilize technology in creating learning media to deliver knowledge to students (Agustian & Salsabila, 2024).

Based on the results of interviews conducted on February 18, 2025, with the homeroom teacher of Grade IV at SDN 006 Pangkalan Indarung, it was found that many students are still unable to recognize, interpret data, and evaluate explanations related to natural phenomena. This indicates a gap in understanding of basic science literacy concepts, which should be a primary focus in the study of the Natural and Social Sciences. In addition, in the teaching and learning process, teachers require learning media that can help deliver material more concretely and engagingly. However, in practice, teachers at SDN 006 Pangkalan Indarung still rely on the school-provided textbooks without using additional media, such as visual, audiovisual, or multimedia resources. This condition renders the learning process monotonous, less interactive, and less aligned with the learning characteristics of 21st-century students, who tend to be visually and digitally oriented. In response to the problems described above, this study proposes a solution by developing science-literacy-based animated video media.

This media is designed to assist teachers in delivering Natural and Social Sciences material in a more contextual, engaging, and easily understood manner for students. The use of science literacy-based animated videos can help students visualize abstract processes or natural phenomena, while also training their scientific thinking skills. In addition, the use of science-literacy-based animated videos can present learning material in a more concise form, making it easier for students to understand. When students find the material easier to understand, their focus and learning outcomes will improve. This is supported by research revealing that factors influencing students' science literacy include the use of animated video-based media (Pratama *et al.*, 2023). This is consistent with studies showing that one factor related to students' learning activities and influencing the low level of students' science literacy skills is learning media (Juniati *et al.*, 2020). Science literacy in science learning needs to be trained so that students are able to apply scientific knowledge in real-life situations (Nasir *et al.*, 2024).

This study has novelty in the development of learning media in the form of animated videos specifically designed based on science literacy for the Natural and Social Sciences subject for Grade IV. In contrast to existing learning media, this media not only presents material in a visual and engaging manner but also integrates aspects of science literacy, such as the ability to understand scientific concepts, analyze

phenomena, and relate them to everyday life. In addition, this media is developed contextually in accordance with the cognitive developmental level of elementary school students, so it is expected to more effectively and enjoyably enhance students' conceptual understanding and interest in science. This study aims to develop animated video media, to determine the validity of the developed validation, and to identify teachers and students responses to science literacy based animated video media for the Natural and Social Sciences subject for Grade IV at SDN 006 Pangkalan Indarung, Kuantan Singingi Regency.

LITERATURE REVIEW

Learning Media

Learning media refer to anything used to convey messages that are useful for stimulating thoughts, attention, interest, and emotions in order to support the learning process (Amrullah *et al.*, 2021). Learning media are one form of instructional aid for teachers in the learning process (Kotimah, 2024). Effective learning media are those that provide opportunities for children to acquire and expand knowledge directly. Such media can enhance language skills, critical thinking, and positive thinking, as well as help children recognize their environment and their own potential (Nurfadhillah *et al.*, 2021). In addition, learning media can foster motivation and increase learning attention in early childhood. Therefore, a professional teacher needs to have an understanding of this. Learning media function as tools for delivering messages in learning activities, particularly in direct instruction models, where the teacher acts as the information provider. In this context, teachers need to select and use appropriate and effective media.

Learning media serve as support in the teaching and learning process, encompassing all elements that are able to stimulate students' thoughts, emotions, attention, and abilities in order to encourage the learning process to occur. Learning media refer to anything used in delivering information or material to students. Learning media are tools or objects used to channel processes or materials to recipients in the educational process (Nurfadhillah *et al.*, 2021). Learning media play an important role in clarifying the delivery of learning messages, facilitating students' interaction with the material, and stimulating learning interest and motivation. The media used are adjusted to the characteristics of students and the material to be delivered. Well-designed media can make the learning process more enjoyable and more in-depth. In addition, learning media are able to increase students' learning motivation, help students understand and remember the material, and make it easier for teachers to explain the material (Haq & Irawati, 2022).

Learning media are important for helping teachers explain learning materials more effectively and for assisting students in understanding the content (Fadilah *et al.*, 2023). The use of learning media can facilitate understanding of the materials and concepts being taught, so that learners are able to achieve satisfactory learning outcomes (Lestari, 2023). The use of learning media provides many significant benefits, one of which is increasing awareness and interest in learning, thereby encouraging learning motivation (Resti *et al.*, 2024). The purpose of developing learning media at the elementary school level is to improve the effectiveness and capacity of learning media and to accelerate the learning process (Khulaifatuzzahra *et al.*, 2024). Based on their characteristics, media can be classified into three types: audio, visual, and audiovisual (Viora *et al.*, 2021). Another perspective states that learning media are divided into two types: adjustable media, such as films projected using projectors, and permanent or non-adjustable media, such as pictures, radio, paintings, and similar forms (Purba, 2020).

Animated Video

Animated video is a medium that integrates audio and visual elements and can be used to attract students' attention. This medium can present objects in detail and assist students in understanding difficult learning materials. Animated video is a medium that combines audio and visual elements to increase student

interest (Apriansyah, 2020). Animated video media are one alternative available to teachers for developing learning media to support the teaching and learning process (Hapsari, 2021). The main characteristics of animated video include an attractive, balanced presentation to capture student attention, as well as the integration of visuals, music, and animation to simplify subject matter. Animated videos must be designed in accordance with the curriculum and established competencies in order to achieve learning objectives (Ningrum, 2024). Animated videos created directly by subject teachers have advantages and disadvantages. One advantage of animated video is that it can facilitate teachers in delivering material to students. Animated videos can attract students' interest, increasing enthusiasm for learning and facilitating understanding of the material (Saputra *et al.*, 2025).

In addition to their advantages, animated videos created independently by teachers have several limitations. Teachers often experience constraints related to production time due to limitations of the applications used, and the production process also requires specific skills. For students, the challenge faced is the need for sufficient internet data to download the videos. The advantages of using video-based learning media include: 1) the ability to be used repeatedly without limitations of distance and time, making them more efficient; 2) the ability to motivate students in the learning process, thereby making learning more engaging; 3) assistance for students in understanding learning materials without being dependent on other learning resources, as well as the ability to take students to various locations without requiring physical visits; 4) the ability of learning videos to display small details directly; 5) the ability to present activities in other locations or events from the past in an informative and reliable manner; and 6) suitability for use with large groups, small groups, or individual learners (Haq and Irawati, 2022; Supriyani *et al.*, 2021).

Science Literacy

PISA defines science literacy as the ability to use scientific knowledge, formulate questions, and draw evidence-based conclusions to understand and inform decisions about the natural world and the changes caused by human activities (Winarni and Purwandari, 2019). Science literacy is the ability of an individual to use scientific concepts, understand scientific processes, and make everyday decisions related to interactions with others and the environment, including an understanding of the relationship between science, technology, and society, as well as social and economic development. Science literacy can be defined as scientific knowledge and skills that enable individuals to identify questions, acquire new knowledge, explain scientific phenomena, and draw conclusions based on facts (Barus, 2022). In addition, science literacy includes an understanding of the characteristics of science, awareness of how science and technology influence the environment, intellectual life, and culture, as well as a willingness to engage in and care about issues related to science.

Good literacy skills can enhance creativity, thereby supporting improvements in academic achievement (Janul and Sunendar, 2025; Komara and Hadiapurwa, 2023). The purpose of science literacy is to equip individuals with the ability to apply scientific knowledge in daily life, enabling them to solve various problems, make appropriate decisions, and improve quality of life (Safitri *et al.*, 2023). Learning that focuses on the achievement of science literacy is aligned with the essence of education, as it emphasizes not only the mastery of knowledge but also the integration of concepts, application, and the development of scientific attitudes (Sukmawati, 2021). It can be concluded that science literacy is the ability of individuals to understand science so that they are able to analyze, think logically, communicate effectively, and solve and interpret problems. An understanding of science literacy is expected to be applied by learners in everyday life.

METHODS

The type of research applied is Research and Development, by adopting the ADDIE development model to create instructional design. The ADDIE model consists of five stages, namely analysis, design, development, implementation, and evaluation. However, this study is limited only to the development stage due to limitations of time, resources, and research scope, which is focused on media validation by experts and limited trials involving teachers and students. The following is a description of the development of science literacy based animated video media that has been conducted.

1. Analysis Stage. The purpose of this stage is to establish and define needs within the learning process. At this stage, teachers are required to formulate instructional actions that can address existing gaps, determine appropriate levels of intervention to manage these gaps, and propose strategies based on empirical evidence that have the potential to improve learning outcomes.
2. Design Stage. The design stage is often regarded as the initial plan in the development process. This phase involves formulating initial concepts to be developed in response to the results of the analysis that has been conducted.
3. Development Stage. This stage is the process of realizing the product design, which in this study takes the form of science literacy based animated video learning media.

In addition, the participants in the validation process consisted of six validators, namely two material experts, two language experts, and two media experts, as well as one teacher and six students in a limited scale trial. Each validator had expertise and experience in their respective fields. Data collection was carried out using instruments in the form of validation sheets for each aspect of material, language, and design, as well as teacher response questionnaires and student response questionnaires assessed using a Likert scale. The data analysis conducted included qualitative and quantitative approaches to present the results in a comprehensive and in depth manner. Qualitative descriptive analysis was used to process data obtained from expert reviews, including media experts, course content experts, and subject matter experts, in the form of suggestions and critiques. Quantitative descriptive analysis was used to process score data from feasibility assessment instruments into descriptive percentage form. The following is the formula used to calculate the quantitative analysis.

$$P \frac{f}{n} \times 100\%$$

Explanation:

P = Percentage

n = Highest score

f = Total score obtained

After the data are analyzed using the percentage formula described previously, the results will be obtained in the form of percentages that reflect the quality of the learning media product. These percentages indicate the level of feasibility of the media and serve as the basis for revising the product based on validation results from media experts and material experts, which are presented in **Table 1**.

Table 1. Product Validity Criteria

No	Validity Score %	Validity Category
1.	25.00-40.00	Not Valid
2.	40.01 -55.00	Less Valid
3.	55.01-70.00	Fairly Valid

No	Validity Score %	Validity Category
4.	70.01 -85.00	Valid
5.	85.01 - 100	Very Valid

Source: Research, 2025

If experts in the fields of content, language, and media state that the science literacy based animated video media contain highly credible content and do not require further improvement or adjustment, then the validation process is considered complete and can proceed to identify teacher and student responses to the media.

RESULTS AND DISCUSSION

This study aims to develop animated video media, determine the validity of the development, and identify teacher and student responses to science literacy based animated video media for the Grade IV Natural and Social Sciences subject at SDN 006 Pangkalan Indarung, Kuantan Singingi Regency. The results of the study are presented based on three stages as follows.

Analysis Stage

In the analysis stage, the focus is on curriculum analysis, material analysis, and teacher analysis. In the curriculum analysis, the main reference used is the Merdeka Curriculum for elementary school, specifically for the Grade IV Natural and Social Sciences subject. In this curriculum, learning is directed towards developing science literacy competencies, understanding scientific concepts contextually, and fostering critical and creative thinking skills. Photosynthesis material is included in the Learning Achievement element "Living Things and Their Environment," with the aim of enabling students to understand the role of plants as living beings that perform essential processes for the sustainability of life on Earth. This curriculum emphasizes meaningful, contextual, and student-centered learning. Therefore, the development of animation-based learning media supports this approach by providing visual and interactive learning experiences that align with student characteristics and the expected learning outcomes. In the material analysis, the material analyzed is photosynthesis, which is part of the topic "plants as living beings" in the Grade IV IPAS subject. Photosynthesis is chosen because it is an abstract science concept and is often difficult for students to understand if presented only verbally or through text.

The photosynthesis process involves several scientific elements such as sunlight, water, carbon dioxide, and the role of green leaves chlorophyll which are highly suitable for visualization through animated videos and a science literacy based approach presents photosynthesis not only by explaining how the process occurs but also by encouraging students to understand the importance of photosynthesis for life and to connect it with phenomena in their surrounding environment such as why plants need watering and sunlight and in the teacher analysis attention is given to the readiness of teachers to implement innovative learning media as teachers act as facilitators who guide students to build understanding through active and engaging learning experiences and within the context of the Merdeka Curriculum teachers are required to be able to select learning media and methods that align with the characteristics of both the material and the students and based on initial observations and interviews some teachers still face challenges in effectively delivering abstract material such as photosynthesis especially if relying only on verbal explanations or textbooks and therefore animation based learning media emerges as a practical solution to help teachers present material visually and contextually and this media is expected not only to enhance the effectiveness of learning but also to enrich teaching strategies and foster teachers enthusiasm to integrate technology into daily learning activities

Design Stage

After the learning problems and needs have been clearly identified in the definition stage the next step is the design stage where the researcher begins to design the animated video media to be developed by taking into account the results of the needs analysis and the characteristics of Grade IV students and the media design is prepared by considering an attractive visual appearance the use of simple language and the presentation of content that is structured and easy to understand and the science literacy based animated video designed will contain material on photosynthesis and the video begins with an opening animation presented in an engaging manner accompanied by light background music and a teacher or narrator voice as an introduction to attract students attention from the beginning while introducing the topic to be discussed and smooth transition animations guide viewers to the next part and next an animated teacher character explains the basic concepts of photosynthesis with the help of visual aids such as the sun water carbon dioxide and plants and the teacher narration is combined with simple animations depicting classroom learning activities and background music continues to play softly to maintain a conducive atmosphere and prevent boredom.

Transitions between sections are designed to flow and not disrupt student focus and the main part of the video presents a visualization of the photosynthesis process with water absorbed by the roots carbon dioxide entering through the leaf stomata and sunlight absorbed by chlorophyll all of these processes are visualized animatively and narratively to help students understand the relationships between these elements concretely and moving animation effects such as flowing water and sunlight entering the leaves serve as the main support in bringing abstract concepts to life at the end the teacher provides a summary of key points in the form of text and visual icons appearing one by one with the aim of reinforcing the photosynthesis concepts in a simpler and easier to remember form and interactive questions or short quizzes such as multiple choice are inserted so that students not only receive information but also actively engage to support science literacy and sound effects such as correct answer or wrong answer are used to provide immediate feedback the following shows the appearance of the science literacy based animated video in the opening section learning objectives and summary as shown in the figure below.



Figure 1. Opening Section, Learning Objectives, and Summary of the Animated Video
Source: Research, 2025

Figure 1 shows the animation display of the interactive learning media designed to deliver photosynthesis material to Grade IV elementary school students and in the first image a female teacher wearing a hijab is shown standing in front of the classroom with a blackboard in the background labeled Photosynthesis and Grade IV SD and this image functions as an introduction or opening of the lesson providing the initial impression that the material will be presented in an engaging and structured manner and in the second image the same teacher is shown in front of the blackboard with a list of learning objectives including understanding the concept of photosynthesis the factors that influence it the products of photosynthesis the importance of photosynthesis for life and the development of process skills and presenting the learning objectives is important to give students direction and focus regarding what will be learned and in the third image the teacher stands in a modern classroom with illustrations of two trees each providing oxygen and

food illustrating the results of the photosynthesis process and this visual helps students understand the benefits of photosynthesis in daily life more concretely overall these three images demonstrate that the animated learning media used is not only visually appealing but also designed to support the understanding of abstract science concepts in a contextual and meaningful way

Development Stage

In this stage visual assets such as character images plants and elements of photosynthesis are created in the form of engaging cartoon illustrations and then the animation process is carried out using software including setting movements transitions and visual flow according to the storyboard and the narration is recorded by the teacher or voice actor with intonation suitable for elementary school students and then synchronized with the animation and background music and sound effects are added to enhance the appeal and atmosphere of the video and after that the video is assembled and edited thoroughly and saved in a format compatible with various learning devices and once the science literacy based animated video media is completed the next step is validation by content experts language experts and design experts as well as obtaining teacher and student responses and this validation aims to ensure that the developed animated video media aligns with the learning objectives the characteristics of the students and is pedagogically acceptable

The validation results from the experts are used as a reference to revise the product and revisions are made according to the suggestions and feedback provided to improve the media before it is trialed with students and the assessment of the media is conducted using a validation questionnaire that includes several statements related to content feasibility language usage and visual design aspects and each statement is rated using a Likert scale to measure the extent to which the media meets the established criteria and once all the data is collected the scores for each aspect are averaged and this average score is then converted into a percentage and averaged again based on the number of respondents or validators involved and the final results of this entire process indicate the validity level of the media serving as the main indicator of whether the science literacy based animated video media is suitable for use in learning activities or still requires revision

Content Expert Validation

Content expert validation aims to assess the suitability of the animated video media content with the basic competencies learning objectives and the accuracy of the concepts presented and the content expert examines whether the photosynthesis material presented is accurate aligned with the curriculum and relevant to the students' lives and input from the content expert is crucial to ensure that the science literacy based animated video does not cause misconceptions among students and contains complete and well-structured material.

Table 2. Content Expert Validation Results

No.	Indicator	Validator 1	Validator 2
1.	Content Feasibility	100%	91,4%
2.	Langueange Quality	95%	95%
	Average	97,5%	93,2%
	Total Average	95,35%	
	Criteria	Very Valid	

Source: Research Data Results 2025

Based on **Table 2**, the developed science literacy based animated video media is classified as highly valid and in the content feasibility aspect, a score of 100 percent was obtained from the first expert and 91.4 percent from the second expert while for language quality both experts gave a score of 95 percent and the overall average of both experts is 95.35 percent, which falls into the highly valid category according to the validation result interpretation criteria and this indicates that the content and language in the media are appropriate, suitable for use, and can effectively support learning

Language Expert Validation

Language expert validation is conducted to assess the use of language in the science literacy based animated video, considering its suitability for the cognitive development level of students readability and clarity of information delivery and the language expert examines whether the language used is simple communicative and easy to understand for Grade IV elementary school students and this validation also aims to avoid the use of terms that are difficult to understand overly long sentences or incorrect grammar and it is expected that the science literacy based animated video media can convey messages clearly and effectively to students however the researcher received minor revisions from the first expert suggesting to add the phrase learning objectives at the beginning of the video number each learning objective and include an illustration of rice

Table 3. Language Expert Validation Results

Indicator	Validator 1	Validator 2
Language Aspects	97,5%	90%
Average	97,5%	90%
Total Average	93,75%	
Criteria	Very Valid	

Source: Research Data Results 2025

Based on **Table 3**, the developed animated video media falls into the highly valid category with the first expert giving a score of 97.5 percent and the second expert giving 90 percent and the overall average of both scores is 93.75 percent, which is classified as highly valid, indicating that the language used in the media is appropriate for the cognitive development level of the students, communicative, and easy to understand, with minor revisions from the first expert suggesting improvements in explanatory sentences and capitalization at the beginning of sentences.

Media Expert Validation

Media expert validation aims to assess the visual and aesthetic aspects of the developed science literacy based animated video and the design expert evaluates the design implementation and benefits and the assessment from the design expert is crucial to ensure that the science literacy based animated video has an attractive and proportionate appearance and is appropriate for the characteristics of elementary school

students in addition, this validation also ensures that the media can be used practically and comfortably in the learning process

Table 4. Media Expert Validation Results

No.	Indicator	Validator 1	Validator 2
1.	Design Aspects	92%	88%
2.	Implementation Aspects	90%	100%
3.	Beneficial Aspects	93,3%	93,3%
	Average	91,76%	93,76%
Total Average		92,76%	
Criteria		Very Valid	

Source: Research Data Results 2025

Based on **Table 4**, the developed animated video media is declared highly valid with an overall average of 92.76 percent and in the design aspect, a score of 92 percent was obtained from the first expert and 88 percent from the second expert while the implementation aspect received a score of 90 percent from the first expert and 100 percent from the second expert and the benefits aspect received the same score from both experts, namely 93.3 percent and the overall average scores from each expert are 91.76 percent and 93.76 percent and these results indicate that in terms of appearance ease of use and the benefits of the media for learning all aspects meet the highly valid criteria and are suitable for use in the IPAS learning process.

Based on the validation results conducted by six validators consisting of content experts language experts and media experts, it can be concluded that the science literacy based animated video on the photosynthesis material for Grade IV elementary school is deemed feasible and can be used in the IPAS learning process and this is supported by the overall average scores from all validators showing percentages in the highly valid category in terms of content feasibility language and visual design and this science literacy based animated video media is considered capable of presenting the material clearly, communicatively, and in accordance with the cognitive development of the students and the developed science literacy based animated video media is highly recommended as an innovative alternative learning media to support IPAS learning in elementary schools.

Teacher Response

Teacher responses were obtained through a questionnaire covering aspects of content feasibility presentation usefulness of the media and suitability with student characteristics and the analysis results show that teachers gave very positive assessments of the developed media and teachers stated that this animated video helps explain the photosynthesis material more clearly and engagingly, and facilitates students' understanding of abstract processes and in addition, teachers assessed that the media aligns with the curriculum uses communicative language and has an attractive visual appearance for elementary school students overall the media is considered highly feasible and effective for use in classroom learning the following table shows the results of the teacher responses

Table 5. Teacher Response Results

No	Indicator	Score
1.	Alignment of Materials with the Curriculum	100%
2.	Appearance and Desain	100%
3.	Language and Information Delivery	90%
4.	Suitability for Use	100%
Average		97,5%
Criteria		Very Valid

Source: Research Data Results 2025

Based on **Table 5**, the science literacy based animated video media is declared highly valid with an average score of 97.5 percent and for the indicators of curriculum alignment, visual design, and usability, teachers gave a perfect score of 100 percent, indicating that the media aligns with the Grade IV IPAS basic competencies, has an attractive appearance, and is suitable for use in learning while for the indicators of language and information delivery, a score of 90 percent was obtained, showing that the language in the video is communicative and understandable for elementary school students overall, teachers assessed that this media is highly effective and supports the learning process, particularly in explaining abstract material such as photosynthesis in a visual and interactive manner

Student Response

Student responses to the animated video media were obtained through a questionnaire covering several indicators such as media appearance, ease of understanding the material, animation attractiveness, and learning interest and the processed questionnaire data yielded an average score falling into the “Excellent” category most students stated that the animated video presented was very engaging, particularly because it used moving images bright colors and enjoyable narration and for the indicator of ease of understanding the material, students reported that they better understood the photosynthesis process after watching the video because the material was presented gradually and accompanied by clear visual illustrations in addition, students also enjoyed the interactive quiz section, which made them feel more involved in the learning process

Table 6. Student Response Results

No	Student Name	Score	Maximum Score	Percentage	Category
1.	Z	60	60	100%	Very Valid
2.	PN	60	60	100%	Very Valid
3.	WL	60	60	100%	Very Valid
4.	MI	60	60	100%	Very Valid
5.	LI	60	60	100%	Very Valid
6.	FF	60	60	100%	Very Valid
Rata-rata			100%		
Kriteria			Sangat Valid		

Source: Research Data Results 2025

Overall, the results of student responses (see **Table 6**) indicate that the animated video media is well-liked, easy to understand, and capable of increasing their learning motivation, particularly for abstract

science topics such as photosynthesis. The media is considered effective as a learning tool for IPAS in Grade IV elementary school. The validation results from the six experts, as well as the responses from students and teachers, show that the science literacy based animated video media is rated as highly valid by all experts, although there are slight differences in assessments among the validators in each area of expertise. These differences are normal because each validator may have different perspectives and priorities in evaluating certain aspects. Nevertheless, overall, all validators agree that the science literacy based animated video media is feasible and suitable for use in IPAS learning..

In addition, teachers assessed that this animated video media is highly effective and supports the learning process, particularly in explaining abstract material such as photosynthesis in a visual and interactive manner. Meanwhile, students found the media engaging, easy to understand, and capable of increasing learning motivation, especially for science topics that are typically difficult to grasp through text alone. The animation, colors, sound, and engaging presentation flow help students stay focused and enthusiastic during lessons. This science literacy based animated video media is considered effective as a learning tool for Grade IV IPAS because it not only delivers information but also helps students understand concepts more concretely and enjoyably. The animated video learning media has several advantages: first, it can motivate or increase students' enthusiasm because it is equipped with teacher animations and varied supporting images, preventing boredom; second, learning can take place anytime and anywhere; and third, the animated video media can be used repeatedly.

Discussion

This study reinforces previous research findings indicating that students who use animated video media are positively influenced in their science literacy skills (Ghifariani *et al.*, 2024). Animated media greatly assists students in understanding the learning material presented through educational animations, thereby minimizing difficulties during the learning process (Haq & Irawati, 2022). This animated video media guides students to identify questions, acquire new knowledge, explain scientific phenomena, and draw evidence-based conclusions, enabling them to understand the characteristics of energy sources. It also raises students awareness of how energy and technology can address energy crises through alternative energy and fosters a willingness to engage with and care about energy-related issues by encouraging energy conservation and optimal use of alternative energy in daily life (Wulandari, 2019).

Most elementary school students often experience boredom during learning, which can reduce their motivation. Therefore, animated video media that aligns with students characteristics can increase their enthusiasm during lessons. In designing effective learning media, it is important to make it simple, easy to understand, and engaging so that students are motivated to learn (Ashary & Komara, 2022; Haq & Irawati, 2022; Sae & Radia, 2023). Animated video media considers several aspects from a science literacy perspective. First, the material presented in this multimedia is closely related to students' daily lives, making it easier for them to understand concepts that they frequently encounter, which aligns with the contextual principle. Second, the multimedia provides complete information tailored to the capacity of elementary school students, in accordance with the holistic and integrated principle. Third, the multimedia is sufficiently varied, as it can be used individually or in groups, fostering participatory and collaborative attitudes, which are also key principles of science literacy (Najib *et al.*, 2023).

The implementation of science literacy should aim to provide students with opportunities to better understand themselves and their environment, as well as to apply their knowledge to solve problems, thereby fulfilling daily needs. Students with strong science literacy skills are expected to possess competencies in attitudes, knowledge, productive and creative thinking, and the ability to take action to face 21st-century challenges. Furthermore, in science learning, students are expected to actively seek and discover concepts, analyze problems, engage in discussions, confidently express ideas, document

their work in reports, and read and present their findings. This aligns with the nature of science learning, which requires students to be able to perform and discover knowledge (Hasanah *et al.*, 2023). Effective learning processes must facilitate students in mastering science literacy skills (Sutiani *et al.*, 2021). The selection of appropriate learning media significantly influences the learning process, and the use of animated videos is expected to help simplify learning through sound, moving images, and colors, thereby making students more engaged during lessons (Apriansyah, 2020; Nurdiana & Sartika, 2024).

CONCLUSION

Based on the validation results from experts and the responses from teachers and students, it can be concluded that the science literacy-based animated video media on photosynthesis for fourth-grade elementary students is highly valid and suitable for use in learning. Expert validation showed that the average ratings fell into the very valid category, both in terms of content feasibility, language, design, and media implementation. Teachers also provided positive feedback, stating that the media is effective for delivering abstract material in a visual and interactive manner and can support classroom learning processes. Meanwhile, students gave very positive responses, indicating that the media is engaging, easy to understand, and capable of increasing learning motivation, particularly in understanding the concept of photosynthesis. Therefore, this media is considered an effective learning tool and can serve as an innovative alternative for delivering science content at the elementary school level. For future research, it is recommended to test the developed media during the implementation stage on a larger scale to measure its effectiveness on student learning outcomes more comprehensively and sustainably.

AUTHOR'S NOTE

The author declares that there is no conflict of interest related to the publication of this article. The author affirms that the data and content of the article are free from plagiarism.

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