

# THE DEVELOPMENT OF ENVIRONMENT-BASED AUDIO-VISUAL TEACHING MATERIALS IN SCIENCE AND SOCIAL LEARNING

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## Abstract

The lack of teacher creativity in creating enjoyable learning means that students do not participate fully in the learning process because they only use lecture approaches and printed books as learning resources. One of the new innovations in this research is producing learning resources in the form of environment-based audio-visual teaching materials. The research and development (R&D) approach used in this research uses a 3D development model starting from define, design and develop. 10 grade IV students participated in research conducted at SDK Majamere. Media experts and material experts carried out data analysis. The information collected consists of quantitative data from expert validation results, teacher and student questionnaire responses, as well as qualitative data from assessor recommendations and comments. The validated presentation obtained a percentage of 88% from material experts, 82% from media experts, and 85% from language experts. The student questionnaire response was 82%, while the teacher response was 83% and 81%. The research conclusion shows that the environment-based audio visual teaching materials developed have a very suitable level of validation so they are good for use in class IV in elementary school science and social subjects.

**Keywords:** Audio Visual, Teaching Materials, Science, Development

## Abstrak

Kurangnya kreativitas guru dalam menciptakan pembelajaran yang menyenangkan membuat siswa tidak berpartisipasi penuh dalam proses pembelajaran, karena hanya menggunakan pendekatan ceramah dan buku cetak sebagai sumber belajar. Salah satu inovasi baru dalam penelitian ini adalah menghasilkan sumber belajar berupa bahan ajar audio visual berbasis lingkungan. Pendekatan penelitian dan pengembangan (R&D) yang digunakan dalam penelitian ini menggunakan model pengembangan 3D yang dimulai dari pendefinisian (define), perancangan (design), dan pengembangan (develop). Sebanyak 10 siswa kelas IV berpartisipasi dalam penelitian yang dilakukan di SDK Majamere. Ahli media dan ahli materi melakukan analisis data. Informasi yang dikumpulkan terdiri dari data kuantitatif dari hasil validasi ahli, respon kuesioner guru dan siswa, serta data kualitatif dari rekomendasi dan komentar penilai. Presentasi yang divalidasi memperoleh persentase 88% dari ahli materi, 82% dari ahli media, dan 85% dari ahli bahasa. Respon kuesioner siswa sebesar 82%, sedangkan respon guru sebesar 83% dan 81%. Kesimpulan penelitian menunjukkan bahwa bahan ajar audio visual berbasis lingkungan yang dikembangkan memiliki tingkat validasi yang sangat layak sehingga baik untuk digunakan di kelas IV pada mata pelajaran Ilmu Pengetahuan Alam dan IPS sekolah dasar.

**Keywords:** Audio Visual, Bahan Ajar, Ilmu Pengetahuan, Pengembangan

## Introduction

In the field of education, learning is a process that involves interaction between students and teachers. Learning activities constitute the most fundamental aspect of the overall educational process in schools<sup>1</sup>. Learning is also a process of acquiring knowledge, understanding, and shaping the character of students, facilitated by educator<sup>2</sup>. Learning is the process of utilizing various learning resources to acquire information, skills, and moral principles<sup>3</sup>.

Knowledge and skills are acquired by students during elementary school education. elementary school educational institutions aim to assist students in reaching their full potential through classroom learning<sup>4</sup>.

Elementary school learning does not necessitate an extensive amount of material or prolonged periods of passive listening to the teacher. It is imperative to consider children's physical endurance to prevent feelings of boredom or fatigue, which may diminish their motivation and focus during the learning process. To optimize the attainment of educational objectives, educators must ensure that elementary school learning serves as a central focus for students and that all activities are meticulously tailored to align with their needs and environmental context. Educators should proficiently utilize educational resources to design learning experiences that actively engage students in the educational process<sup>5</sup>. In the learning process at the elementary school level, students will study subjects such as Religious Education, Civic Education, Mathematics, Physical

Education, Social Sciences, Cultural Arts, and Natural Sciences, all of which are part of the implemented curriculum.

One of the subjects taught in elementary school is Natural Sciences (IPA). Natural Sciences education at the elementary level serves as a fundamental foundation for shaping students' concepts and providing them with an understanding of basic scientific ideas, which are later connected contextually to everyday life. Students learn about nature, enhance their ability to solve environmental problems, and develop critical and objective thinking skills<sup>6</sup>.

Through various learning activities, Natural Sciences education enables students to gain an understanding of the environment and its contents. Natural Sciences education is a methodical approach to teaching about nature. Therefore, Natural Sciences is not merely about mastering facts, concepts, or principles, but also involves the process of experimentation in the learning process<sup>7</sup>.

The role of an educator is instrumental in fostering high-quality learning experiences. As a model in the educational process, educators must be capable of making learning an engaging and enjoyable experience for students. Natural Sciences education places significant emphasis on direct experiences to cultivate the skills necessary for exploring and comprehending the natural world. In order for Natural Sciences education to be engaging, it is essential to establish a connection between the content being taught and the students' daily lives<sup>8</sup>. The way a teacher

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<sup>1</sup> Maria Yuliana Kua, "Tabung Suntik Untuk Hukum Boyle, Simulasi Pengukuran Tekanan Udara Dengan Real World Problem Sebagai Alternatif Pemecahan Masalah", *Imedtech (Instructional Media, Design and Technology)*, 4.2 (2021) <<https://doi.org/10.38048/imedtech.v4i2.225>>.

<sup>2</sup> Elsa Kaniawati and others, "Evaluasi Media Pembelajaran", *Journal of Student Research (JSR)*, 1.2 (2023).

<sup>3</sup> Suparmi et al., (2024)

<sup>4</sup> Maria Yuliana Kua and others, "Pendampingan Belajar Berbasis Game Edukasi Sebagai Upaya Meningkatkan Kemampuan Kognitif Siswa Sdk Niode", *Jurnal Citra Kuliah Kerja Nyata*, 1.3 (2023) <<https://doi.org/10.38048/jckkn.v1i3.2158>>.

<sup>5</sup> Kua.

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<sup>6</sup> Aisyah Sabilla Rahmi and others, "Pengembangan Profesionalitas Guru Dalam Memahami Karakter Siswa Sekolah Dasar", *Danuh Guru: Jurnal Pendidikan MI/SD*, 2.2 (2022) <<https://doi.org/10.35878/guru.v2i2.400>>.

<sup>7</sup> Vivi Lusidawaty and others, "Pembelajaran Ipa Dengan Strategi Pembelajaran Inkuiri Untuk Meningkatkan Keterampilan Proses Sains Dan Motivasi Belajar Siswa Di Sekolah Dasar", *Jurnal Basicedu*, 4.1 (2020) <<https://doi.org/10.31004/basicedu.v4i1.333>>.

<sup>8</sup> Saferin Goldiana Nggia, Maria Yuliana Kua, and Dek Ngurah Laba Laksana, "Pengembangan Bahan Ajar Ipa Berbasis Kontekstual Materi Tekanan Zat Dan Penerapannya Dalam Kehidupan Sehari-Hari Bagi Siswa

imparts material and how well students understand it can be influenced by the teacher's experience and level of expertise<sup>9</sup> Teachers must create engaging teaching materials to help students better understand the learning content.

Teachers and students utilize teaching materials that have been systematically organized in the learning process<sup>10</sup>. Typically, teaching materials are categorized into two types: printed and non-printed. Audio materials fall under the non-printed category<sup>11</sup>. One of the non-printed teaching materials that can effectively and simply explain an event to students is video<sup>12</sup>

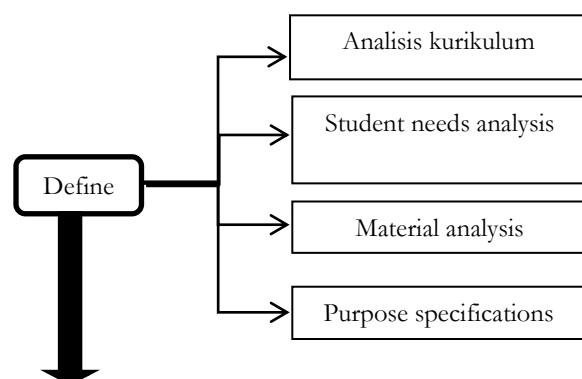
To support the learning process, non-printed teaching materials such as audio, video, audiovisual, and multimedia are systematically organized. Teaching materials that display moving images, colors, as well as written and oral explanations are known as audiovisual materials. When learning with audiovisual sources, both visual and auditory senses are used to process information<sup>13</sup>. One of the strategies created by teachers to make the learning process more engaging and inspire students to learn is the use of audiovisual teaching materials<sup>14</sup>.

Based on the findings from observations and interviews with Natural Sciences teachers, the learning activities are less engaging because teachers typically teach Natural Sciences using a lecture method and rely solely on textbooks, which leads to student boredom and a lack of interest in the subject. In response to this issue, the researcher developed environment-based audiovisual teaching materials for Grade IV students.

### Research Method

This type of research is part of development research and is often referred to as Research and Development (R&D). The 4D model used was adopted as the basis for this research model, originally proposed by Thiagarajan (1974), and subsequently modified into the 3D model. The stages of definition, design, and development are all included in the 3D model. This study aims to create a product. The final outcome of this research is the environment-based audiovisual teaching materials that provide benefits for both teachers and students during the learning process. Grade IV students were selected as the research subjects. Questionnaires assessing the responses of teachers and students to the environment-based audiovisual teaching materials, as well as validation sheets completed by validators, served as the data collection tools for this research.

The researcher did not conduct an effectiveness test of the product; therefore, this study is limited to the development stage. The procedure is more structured, making it easier for the researcher to understand. The 3D model was chosen for this study, which begins with the steps of definition, design, and development.



Smp Kelas Viii', *Jurnal Citra Pendidikan*, 3.1 (2023), 708–14 <<https://doi.org/10.38048/jcp.v3i1.1104>>.

<sup>9</sup> (Humayra et al., 2022)

<sup>10</sup> Endang Nuryasana and Noviana Desiningrum, 'Pengembangan Bahan Ajar Strategi Belajar Mengajar Untuk Meningkatkan Motivasi Belajar Mahasiswa', *Jurnal Inovasi Penelitian*, 1.5 (2020) <<https://doi.org/10.47492/jip.v1i5.177>>.

<sup>11</sup> Ana Rafikayati, Sambira Sambira, and Muhammad Muhyi, 'Pengembangan Bahan Ajar Audio Dalam Pembelajaran Daring Untuk Mahasiswa Tunanetra Di Universitas PGRI Adi Buana', *Jurnal ORTOPEDEGOGLA*, 6.2 (2020) <<https://doi.org/10.17977/um031v6i22020p120-124>>.

<sup>12</sup> (Astuti et al., 2023)

<sup>13</sup> Aulia Muthiatus Sa'adah and Mohammad Rofiq, 'Pengembangan Bahan Ajar Audio Visual Menggunakan Animasi Dan Film Kartun Dengan Aplikasi Filmora Pada Materi Interaksi Sosial Kelas 3 MI/SD', *Ibtida'i: Jurnal Kependidikan Dasar*, 10.2 (2024) <<https://doi.org/10.32678/ibtidai.v10i2.9454>>.

<sup>14</sup> Jazilatur Rahmah Ichsan and others, 'Media Audio Visual Dalam Pembelajaran Di Sekolah Dasar', *Seminar Nasional Hasil Riset Dan Pengabdian Ke-III (Snbrp-III 2021)*, 2021.

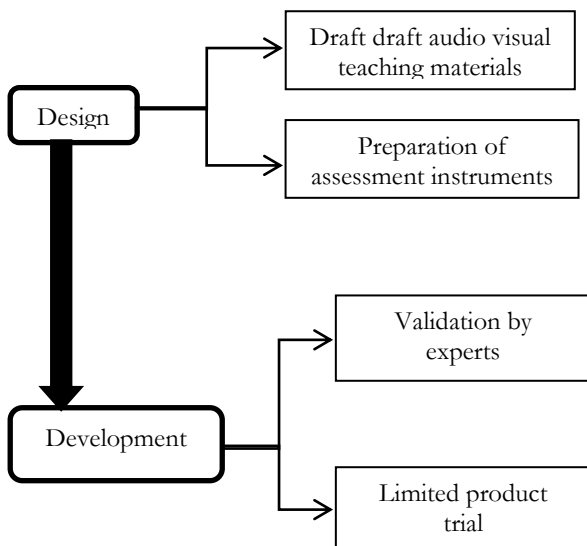


Figure 1. 3D Model Development Flow

In the initial step, the researcher analyzes the curriculum for the class, the subject matter, evaluates the students' needs, and establishes the objectives during the definition phase (define). In the second phase, referred to as the design stage, the researcher commences the development of the product by aligning the instructional materials with the learning outcomes and the progression of the instructional objectives. The researcher subsequently drafts the audiovisual teaching materials to be created using Canva, incorporating illustrative images that are pertinent to the content produced in the video. Following the creation of the product design, the researcher constructs a product validation instrument, adapted from the National Education Standards Agency. In the final phase, known as the development stage, the researcher generates the final version of the product. Upon completion of the development process, the researcher provides the product and validation sheets to validators for evaluation to determine its appropriateness.

The research was conducted at SDK Majamere, located in Mauponggo District, Nagekeo Regency. A total of ten Grade IV students and two teachers from SDK Majamere participated in the study. In this research, both qualitative and quantitative data were used. The observation and interview methods yielded qualitative data, while expert validation, feasibility

testing, and teacher responses provided quantitative data.

Qualitative and quantitative data were incorporated into the data analysis process. The quantitative data were validated by experts in the fields of subject matter, language, media, teacher assessments of the use of learning resources, and student responses to audiovisual teaching materials. Recommendations and feedback from the experts on the validation sheets were used to gather qualitative data. The following formula was employed to conduct the analysis of the quantitative data:

Information:

NP = percentage value targeted or sought

R = initial score result achieved

SM = Maximum score

100 = fixed number

The percentage of the calculated values is then compared with the percentage interpretation table on the Likert scale attached in table 1 below.

Table 1. Interpretation of Percentage of Likert Scale Results.

No	Interpretation	Percentage
1	Very less feasible	1%-20%
2	Less feasible	21%-40%
3	Quite feasible	41%-60%
4	Feasible	61%-80%
5	Very feasible	81%-100%

Source. Lauren., (2023)

The researcher collected data using validation sheets from the National Education Standards Agency (BSNP) regarding the teacher and student response questionnaires on the feasibility of the audiovisual teaching materials. Tables 2 and 3 display the validation grids for the teacher and student response questionnaires.

**Table 2.** Product Assessment Instrument Grid by Environmentally Based Audio Visual Teaching Materials Experts

No	Validator	Assessment Aspect	No. Indicator Item
1	Material expert	Introduction	1,2,3
		Material content	4,5,6,7,8,9,10
2	Media expert	Video display	1,2
		Teaching material content	3,4,5,6,7
3	Linguist	Straightforward	1,2,3
		In accordance with Indonesian language rules.	4,5
		In line with student development.	6,7

Source. BSNP. 2008

**Table 3.** Grid of Teacher and Student Response Questionnaire for Teaching Materials

No	Assessment components	Indicator item number	Value
1	Visual and audio	1, 2, 3, 4, 5, 6,	30
2	Language	7, 8	10
3	Material content	9, 10, 11	15
Total Score			55

Source: BSNP. 2008

## Finding and Discussion

### Finding

The researcher observed the curriculum used at the school during the definition stage and found that both the K13 curriculum and the Merdeka curriculum were implemented. Classes II, IV, and V use the Merdeka curriculum, while classes I, III, and VI follow the K13 curriculum. The materials used in Grade IV were also examined by the researcher. Based on the findings, textbooks serve as learning resources, and teachers employ a lecture style. Furthermore, audiovisual teaching materials are rarely used in the classroom. Additionally, the researcher discovered that the Grade IV curriculum includes content on the parts of plants and their functions, which is part of the Merdeka curriculum. Based on these findings, the researcher developed

environment-based audiovisual teaching materials for Grade IV students to enhance their enthusiasm for the IPAS (Science and Social Studies) subject.

The researcher designed the product during the design phase, starting with: 1) drafting the audiovisual teaching materials to be developed using Canva, 2) gathering images that align with the material on the parts of plants and their functions, such as images of plant parts found in the students' environment, and 3) to assess the validity of the developed product, the researcher created a product evaluation instrument for the audiovisual teaching materials after designing the product. University lecturers acted as media validators, teachers as validators for content and language, and teachers also as validators for the subject matter. Additionally, response questionnaires were distributed to IPAS teachers and students.

Using the Canva application, the researcher created environment-based audiovisual teaching materials during the development phase. The following are the steps for creating audiovisual teaching materials with the Canva application :

- 1) Find the title on the first open material display.
- 2) Create a script with the content that will become part of the open material.
- 3) Search for and prepare media such as images and videos related to the parts of plants.
- 4) Open the Canva application and create a new project.
- 5) Import all teaching materials (images and videos) to be used.
- 6) Edit the videos and photos by combining them into a cohesive unit, then modify the images and videos and trim any irrelevant footage.
- 7) Include text in the video.
- 8) Use the Capcut app's voice recorder to add audio related to the material to be explained.
- 9) Adjust and modify the audio and video volume to match the material.
- 10) Name the project and save it.
- 11) Export the video project in your preferred format to create the final video.



Figure 1. Canva Application Display



Figure 2. Opening Video



Figure 3. Content of the Material

The audiovisual teaching material produced has a duration of 4 minutes and 33 seconds, as shown in Figures 1, 2, and 3. The title and main content are components of the audiovisual teaching material created by the researcher.

The questionnaire provided to the validators, which includes evaluation aspects related to the presentation of the content in the prepared audiovisual teaching material, yields the evaluation results for the validation of the material. The validation sheets given to the validators contain assessment aspects regarding how the content is presented in the audiovisual teaching material. Each question is scored on a scale from 1 to 5. The experts in the fields of content, media, and language are Natural Sciences teachers at SDK

Majamere. Table 4 presents the evaluation results from these experts.

Table 4. Expert Validation Results for Environmentally Based Audio Visual Teaching Materials

Validator	Assessment aspects	Value obtained	Total	Score	Predicate
Material expert	Introduction	14	44	88%	Very feasible
	Material content	30			
Media expert	Video display	8	29	82%	Very feasible
	Teaching material content	21			
Linguist	Straightforward	12	30	85%	Very feasible
	In accordance with Indonesian language rules.	9			
	In line with student development.	9			

Table 4 shows that the content expert rated the environment-based audiovisual teaching materials at 88%, with a designation of "very feasible." The media expert's evaluation of the environment-based audiovisual materials resulted in a validation score of 82.8%, categorized as "very feasible."

To determine the practicality of the environment-based audiovisual teaching materials, the researcher conducted a trial based on the responses from IPAS teachers. Tables 5 and 6 present the data.

Table 5. Teacher Assessment Questionnaire for Environmentally Based Audio Visual Teaching Materials.

Assessment aspects	Number of Subjects and Scores Obtained	
	Teacher 1	Teacher 2
Visual and audio	23	24
Language	9	8
Material content	14	13
<b>Total</b>	<b>46</b>	<b>45</b>
<b>Score</b>	<b>83,6%</b>	<b>81,8%</b>
<b>Predicate</b>	<b>Very feasible</b>	<b>Very feasible</b>

The first teacher received a score of 83.6%, and the second teacher received a score of 81.8%, both of which are considered "very feasible." Table 5 shows that IPAS teachers gave positive responses to the environment-based audiovisual teaching materials. Additionally, 82.1% of the students' responses were categorized as "very feasible" regarding the use of the environment-based audiovisual teaching materials. Table 6 below presents data on student responses to the environment-based audiovisual teaching materials.

**Table 6.** Student Assessment Questionnaire for EnvironmentallyBased Audio Visual Teaching Materials.

Assessment aspects	Number of Subjects and Scores Obtained									
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Visual and audio	23	23	21	25	23	23	24	24	2	24
Language	8	9	9	9	7	10	7	7	7	8
Material content	13	15	13	13	13	15	14	13	1	15
Number	44	46	43	47	43	48	45	44	4	47
Percentage	80	83,6	78,1	85,4	78,1	87,2	81,8	80	7,8	85,4
Total Score	82,1%									
Category	Very feasible									

### Discussion

One of the topics taught to Grade IV elementary school students is the parts of plants and their functions. The researcher utilized this information as a foundation to create an environment-based audiovisual teaching material product. The goal of this product development is to increase student interest in learning and make the learning material easier to understand. This step is relevant to the research<sup>15</sup> which highlights that interactive teaching materials can be used with modern adaptations to increase student interest in learning and reduce their dependence on the teacher's presence. This will also help students develop a sense of independence. According to previous research conducted by<sup>16</sup>,

<sup>15</sup> Meduri (2022)

<sup>16</sup> Magdalena (2021)

The use of engaging teaching materials can make learning enjoyable and capture students' attention. It is expected that science teachers in elementary schools can create an enjoyable learning experience for students through appealing environment-based teaching materials.

The Research and Development (R&D) method is used in this study. The structure of the *Kurikulum Merdeka* includes learning outcomes (CP), learning objectives, and the flow of learning objectives (ATP), all of which are integrated into the creation of audiovisual teaching materials. Teachers can design the material according to students' needs and their environment using the *Kurikulum Merdeka* framework (Kemdikbud, 2022). A qualitative and quantitative approach is employed to evaluate the product, with assessments provided by content and media experts.

The presentation of the teaching materials and the selection of audiovisual materials are tailored to students' daily lives. Photos and videos chosen are aligned with students' knowledge of the parts of plants and their functions. Tables 4, 5, and 6 will show the evaluation results after the product is validated by experts using assessment instruments.

The assessment criteria and scores range from 1 to 5, representing the evaluation of the product's suitability, as shown in the table. With a validation score of 88% for the content expert and 82% for the media expert, the data indicates a very feasible validity level. The results of the teacher response questionnaire show a score of 83% for the first teacher and 81% for the second teacher. Meanwhile, the student responses as users of the teaching materials reached 82%.

In Grade IV, environment-based audiovisual teaching materials are used as a strategy to enhance students' enthusiasm for learning. According to research<sup>17</sup>, teaching materials are all resources that connect learning with the students' everyday life context, allowing students to gain direct experience to enhance the meaningfulness

<sup>17</sup> Lopa et al., (2024)

of learning. Since everyone is actively involved, the use of teaching materials will improve the effectiveness of the learning activities. Learning will be more enjoyable when using realistic audiovisual teaching materials, which simultaneously allow for active participation from both the teacher and the students<sup>18</sup>.

The research by Kigo (2023) titled "Development of Audio-Visual Learning Media in Thematic Learning on the Theme 'Our Environmental Friend' in Grade V Elementary School" is relevant to the findings of this study on the use of environment-based audiovisual teaching materials. These audiovisual materials demonstrated a practicality score of 80%, as per the development results, and were categorized as highly practical, successfully increasing students' interest in science. The research<sup>19</sup> also showed that audiovisual teaching materials had an average validation score of very good on the aspects of content, media, and language.<sup>20</sup> It suggests that environment-based audiovisual teaching materials should be used as a guide in teaching IPAS (Science and Social Studies), as they are easy to understand, capture students' attention, enhance their thinking abilities, and provide real-life experiences. Audiovisual teaching materials should be complemented with images combined with real videos related to the material being explained<sup>21</sup>

## Conclusion

It is recommended to incorporate environment-based audiovisual teaching materials into the learning process. These materials facilitate students' understanding of the content and serve to enhance their motivation to learn. The development of the environment-based audiovisual teaching materials has been deemed valid and highly feasible based on the validation results from experts in content, language, and media, as well as the responses from teacher and

student questionnaires. The validation scores from the content, media, and language experts were 88%, 82%, and 85%, respectively. Additionally, the teacher responses in the questionnaire reached 83% for the first teacher, 81% for the second teacher, and 82% for the students.

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<sup>18</sup> Nonggi et al., (2021)

<sup>19</sup> Kurnia et al., (2023)

<sup>20</sup> Siswanto et al., (2022)

<sup>21</sup> (Maslina et al., 2020)



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