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Development of Video Clips of Childrens Song about Food Chain to Increase Students' IPAS Learning Outcome

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Abstract: Abstract concepts in learning materials often become a challenge for students in understanding the concepts of the material, such as the food chain material in IPAS learning. This research developed audiovisual media in the form of video clips of children's songs, which were developed using the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model, with the aim of increasing students' understanding as measured by increasing their learning outcomes. The stages of this research include needs analysis, media design, product development, implementation, and evaluation of media effectiveness. Children's song video clip media was proven suitable for use after going through a validity test with a score of 92.1% from material experts and 91.25% from media experts. The increase in learning outcomes is evidenced by the increase in pretest and posttest results, with an average of 73.57 to 84.29 in the small group and an average of 70.25 to 80.75 in the large group. A positive response was also obtained in this study, with a score of 97.5% from the teacher response questionnaire and 90.91% from the student response questionnaire. In addition, this study was considered successful because the t-test obtained a Sig. (2-tailed) or significance value of 0.000 in both small and large groups, which means that the pretest and posttest were significant, because the significance value was less than 0.05, then in the N-Gain test, a value of 0.4170 was obtained in the small group and 0.3617 in the large group. Both scores indicate that the effectiveness of learning is in the medium category, because the N-Gain test value obtained in both small and large groups is in the range of 0.3-0.7. The results of this research conclude that the combination of audio media in the form of songs and visual media in the form of video clips can be a solution in overcoming low levels of understanding and improving learning outcomes in the learning process, especially for food chain material.

Keywords: Food Chain; Learning Media; Learning Outcome; Video Clips; Children's Songs.

Introduction

IPAS or Ilmu Pengetahuan Alam dan Sosial is a subject that plays an important role in building an understanding of the natural environment and social environment, especially at the elementary school level. Considering that IPAS is a subject that plays an important role in improving students' abilities and knowledge, then IPAS learning should be carried out as optimally as possible, but in fact in IPAS learning there are many material concepts that tend to be abstract, making it difficult for students to understand, one of which is the concept of food chain material. In the research of Qorimah [1], it was stated that the food chain material in IPAS learning consists of 88% abstract concepts and 12% concrete concepts, as shown in Figure 1.

The fairly large percentage comparison certainly affects the learning process, because the explanation of the material with abstract concepts will make it difficult for students to understand and remember the material presented, Knowing the process of learning science which contains many abstract concepts in its material, but in actual conditions, learning science is often limited to the lecture method and only based on textbooks, as stated by E. M. Kusuma & Setyawan, [2] that learning science in class mostly only relies on the lecture method, which, of course, results in monotonous student activities, namely only listening and taking notes according to what the teacher says as an educator. Kosim [3] explained that elementary school students really need stimulus in concrete form to make it easier for them to understand abstract concepts; therefore, learning science on food chain material should be carried out using learning media so that the learning process and results are more optimal.

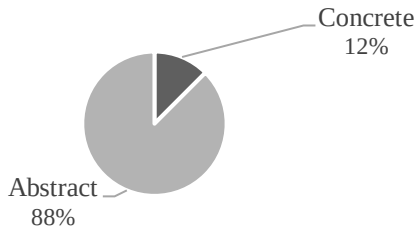

Figure 1. Diagram of Food Chain Material Concept Presentation

Observation results at SDN Bringin 02 show that on average, teachers as educators still rely on the use of lecture methods in the learning process, including in science learning in grade 5, so the use of learning media is needed so that students are able to think and analyze the material more

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optimally, especially on material with abstract concepts [4]. In line with this opinion, Kusuma & Airlanda [5], explain that one of the media that can be used to help students think and analyze learning material that is difficult to understand is by using children's songs. Sujiono in [6] explained that songs have a role in guiding children to be able to understand the material from the lyrics listed and then sung. Songs are also considered to make it easier for children to increase their vocabulary and improve their understanding of meaning. Children's song media is considered a media that can maximize children's learning experiences because it involves most of the senses, namely to hear, observe, absorb, and feel a more enjoyable learning process, so that through children's song media students can find it easier to understand the material by memorizing lyrics or remembering the concept of the material according to the song that has been heard [7].

Through the perspective of multimodal learning theory, Lu [8], explains that "children learning languages often rely on illustrations", in his study, Lu argues that it is very important in learning to involve the visualization process through illustrations that can help children understand abstract concepts in learning. This is also in line with the opinion of Sulistyaningrum [9] who explained that learning that involves many senses will increase children's learning motivation, so that the learning process can cover a broader level of understanding, such as learning through visuals and auditory. Then in his book entitled "Multimodal Literacy: Theory, Design, and Application", Sahiruddin [10] argue that learning based on multimodal theory can increase the effectiveness and activeness of the learning process, if it involves the use of digital technology, which acts as a source of content and tools that are integrated with learning media, so that the learning carried out is more systematically conceptualized.

Multimodal theory supports the use of audio-visual-based learning media, such as the use of children's song media packaged in the form of video clips, because this media requires children to be able to focus on listening, paying attention, and observing the learning media presented, so that children are able to get a more optimal learning experience through their various senses. Sunami & Aslam [11] explained that the use of audio-visual learning media in the form of animation will have a positive impact on student learning outcomes. This opinion is supported by the theory of Sampierpi, n.d in [12] which explains that the application of animated videos in the learning process is more effective when compared to the application of learning models without using animated videos, because animated videos can provide stimuli that have an impact on increasing student interest and activity in the learning process. The use of children's song media packaged in the form of video clips has been proven to be in line with the multimodal theory which states that learning runs more optimally if it involves several of the child's senses, the presence of audio elements from the lyrics and song instruments and visualizations in the form of animated clips, of course, can provide a fun learning experience and make it easier for children to understand the concept of the material.

Viewed from an empirical perspective, there are various studies that show the use of audio-visual media in the learning process, especially the visualization of children's songs, which have been proven to improve student learning outcomes. For example, in a study conducted by Rahayu [13] It was concluded that children's song visualization media can overcome boredom that is often encountered in science learning. The use of video and song media has also been proven to improve children's learning outcomes through pretests and posttests that have been carried out. Then, a study conducted by Tania [14] showed that the use of songs in science learning has been proven to be able to improve cognitive learning outcomes when compared to classes that do not use song media, this is because the concept of material that requires higher understanding and memorization skills can be assisted by the presence of song lyrics that are in accordance with the content of the material concept. In addition, research by P. A. Kusuma & Airlanda [5] explains the feasibility of using song media packaged in video form in science learning, as evidenced by the score of 86% from media experts and 93.33% from material experts. Unfortunately, in this study, the media developed was not tested in the form of direct research in the classroom, so student learning outcomes cannot be used as a benchmark for the success of the media that has been prepared.

From several previous studies that have raised the topic of developing children's song media in learning, it turns out that it is still rare to find the use of children's songs that are combined or packaged in the form of visualization videos, although there are several studies that have combined song media with video visualization, but it is still rare to find research that refers to the success of efforts to improve the results of learning science on food chain material by using children's song media that is visualized in the form of animated videos, therefore the purpose of this study is to develop children's song video clip media for food chains that are packaged in the form of animated videos to improve the learning outcomes of food chains for grade V students at SDN Bringin 02.

Research Methods

Types of research

This study uses the R&D (Research and Development) research type or development research. This type of research focuses its research on the product manufacturing process and its testing with the aim of ensuring the quality and effectiveness of the resulting product [15]. This development research is combined with the ADDIE research model procedure, namely analysis, design, development, implementation, and evaluation. This development research produces a video clip media of a children's song containing the concept of food chain material in class V science learning.

Time and Place of Research

This research was conducted in the even semester of the 2024/2025 academic year, with the research subjects being grade V students at SDN Bringin 02 located at Jl. Beringin Raya No.99, Bringin, Ngaliyan District, Semarang City, Central Java.

Subject of the Research

The subjects of this study were 27 fifth-grade students from SDN Bringin 02.

Data Collection Technique

The data collection technique used in this study is a combination of several techniques, namely tests (pretest and posttest), interviews, questionnaires, observation, and documentation. Several data collection techniques can be used and combined as data collection techniques in a study to obtain diverse data sources and allow for a higher level of data validity [16].

Data Analysis Techniques

The research conducted is based on several data analysis techniques in the form of tests, namely normality tests, t-tests, and N-Gain tests. The data obtained from several tests are used as indicators that determine the success of the implementation of children's song video clip media on the food chain material that has been developed in an effort to improve the learning outcomes of class V students in science.

Normality Test

The normality test is carried out with the aim of knowing whether the initial data results have a normal distribution or not. The normality test is carried out by calculating the pretest and posttest values as prerequisite data for the hypothesis test. The normality test is carried out with the help of the SPSS 21 application. The significance level in the normality test is 5%, so that $\alpha = 0.05$. Criteria: if sig> 0.05, then the data is normally distributed, and if sig <0.05, then the data is not normally distributed.

T-Test

The t-test was conducted through a paired sample t-test in a limited trial and an independent sample t-test in a large-scale trial. The significance level in the t-test is 5%, so that $\alpha = 0.05$. If sig (2-tailed) > 0.05, then Ho is accepted, and if sig (2-tailed) < 0.05, then Ho is rejected.

N-Gain Test

The N-gain test is used to determine the increase from pretest to posttest. The N-gain test can be done with the help of the SPSS application. The following are the N-gain test criteria according to Malzer in Syahfiltril [17].

Table 1. N-Gain value criteria

N-Gain Score	Criteria
N-gain < 0.3	Low
0.3 ≤ N-gain ≤ 0.7	Medium
N-gain ≥ 0.7	High

Results and Discussion

This study focuses on the development of children's song learning media packaged in the form of animation-based video clips using the ADDIE model. The ADDIE research model includes five main stages, which are analysis, design, development, implementation, and evaluation [18]. Sezer in [19] argues that ADDIE is a very appropriate approach to use in development research, because this model emphasizes the coordination process that is established between one stage and another, so as to maximize the products developed.

Analysis

In the first stage, namely analysis, the researcher identified the problems that occurred in the science learning process at SDN Bringin 02. Based on the results of observations which were also supported by interviews with grade 5 teachers, it was found that the main obstacle in science learning at SDN Bringin 02 was learning that had not maximized the use of media, whereas teachers use learning media as a means of delivering material so that it is easier for students to understand it well [20], especially to make it easier to explain material with abstract concepts, so that it requires better visualization. The grade 5 teacher admitted that students often felt bored with learning that only focused on the lecture method, as had been practised by teachers. Especially in the food chain material, students found it difficult to understand the concept of the food chain cycle, because there was no learning forum that could improve their understanding more optimally. Therefore, the development of children's song video clip media is based on the food chain material which is still difficult for students to understand, especially with the abstract concepts contained therein, this media is intended to make it easier for students to understand and memorize the concepts and components in the food chain cycle, so as to improve the learning outcomes of grade V students in the science subject of the food chain material. The advantage of song media is that it can be played repeatedly according to the needs of students and helps develop students' imagination [21], this is certainly very appropriate for the needs of IPAS learning, especially food chain material. In addition, Anggraeni [22] stated that children's songs tell about children's experiences, emotions, desires and imagination, so that they can help develop imagination and the use of simple words in each lyric.

Design

Based on the results of the analysis that has been carried out in the next stage, the researcher continues the design stage, which is carried out with the component design process of the developed learning media. The initial step at this stage is to compile learning devices in the form of teaching modules with a problem-based learning (PBL) model. The researcher chose the PBL model with the aim of raising problems encountered and later used as learning materials, so that students are able to understand the concept of the food chain cycle based on problems that can be found in their environment, PBL also allows students to develop their own understanding, improve higher-order thinking skills, develop independence, and increase their self-confidence [23]. The material contained in the learning device will later be arranged into the core content in the media that is developed, either through song lyrics or animations in the video clip. Children's song media packaged in animated video clips was chosen because it combines audio and visual media simultaneously. Audio-visual media has been proven to be able to maximize the learning process because it utilizes many of the child's senses, so that their level of learning focus will result in a more optimal

understanding of the material and produce maximum learning outcomes [11]. Through the use of audio-visual media, students will also tend to be more motivated to learn and better able to understand the material presented [24].

The lyrics designed for this media are educational in nature, referring to the concept of food chain cycle material, then combined with musical instruments with a happy nuance to support students' enthusiasm for learning, because songs sung with musical accompaniment make children quickly remember the lyrics and enjoy singing them [25]. Researchers will use the help of tools in the form of an external mic and the CapCut application in composing the song. Furthermore, the video clip that will be made contains animations of animals that play a role in the food chain cycle. Researchers will use the Canva and CapCut applications in the process of compiling and editing the animated video clip.

Development

Next, in the development stage, the researcher began to realize the design of the learning media components that had been prepared in the previous stage. The design of the song lyrics was realized into a complete song with the help of an external mic in the recording process and the help of the CapCut application in the editing process.

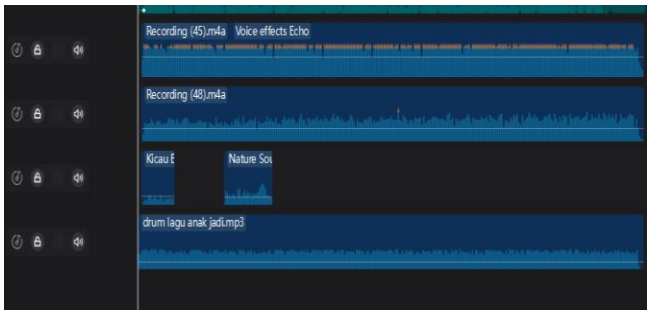

Figure 2. Children's Song Editing Process on the CapCut Application

The final lyrics of the children's song Food Chain consist of 5 verses with the following details:

Ayo bersama, belajar rantai makanan,
Siklus makan dimakan, yang ada di sekitar kita,
Rantai makanan, merupakan bagian dari ekosistem,
Ada makhluk-makhluk hidup sebagai komponen dan memilik peran masing-masing,
Tumbuhan jadi produsen, berperan membuat makanan,
Kemudian hewan memakannya dan berperan menjadi konsumen,
Padi dimakan tikuss, padi perannya produsen,
Tikus yang memakan padi, menjadi konsumen pertama,
Tikus berlari di sawah, ternyata ular memantau,
Tikus lengah sedikit, hap…. ular memakannya,
Tikus dimakan ular, ular pun merasa kenyang,
Ular yang memakan tikus (berperan) sebagai konsumen kedua,
Ular pun berjalan-jalan, memutari persawahan,
Dari atas terlihat si elang yang siap menerkam,
Elang yang makan ular, berperan jadi konsumen,
Konsumen ke berapa? konsumen tingkat ketiga,
Tak lupa di ujung rantai,
Ada peran si pengurai,
Seperti jamur dan bakteri,
Yang siap memulai siklus lagi (2x)

The animation in the video clip was made using the Canva and CapCut applications. This process is the realization of the video clip concept design, containing animations of animals that have a role as components in the food chain cycle, especially in the rice field ecosystem food chain cycle, according to the scenario in the learning device that has been prepared. Researchers use the Canva application to compile animated clips containing animal activities as components of the food chain in the rice field ecosystem. In addition, researchers also include lyrics from children's songs that have been made into each clip.

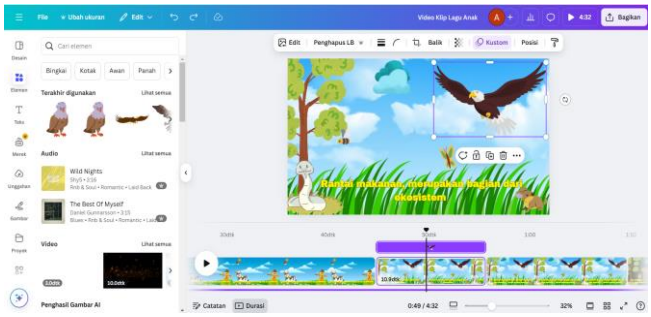

Figure 3. Animation Editing Process on the Canva Application

Next step, the researcher used the help of the Canva application in combining the animated clips that would be arranged into a complete children's song video clip. The researcher used the features in the Canva application to combine the clips that had been arranged to match the lyrics of the children's song that had been created previously.

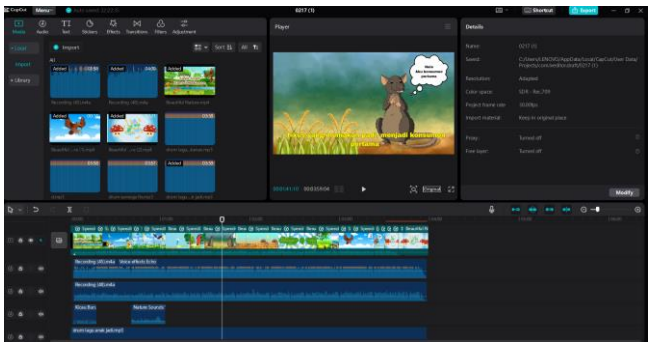

Figure 4. Video Clip Editing Process on the CapCut Application

After the researcher has finished compiling the learning tools, song lyrics, and video clips of children's songs, the next step is the process of validating the material and validating the media to the experts. The validation process is needed as a level of assessment of the feasibility of all media components before they are implemented to students. The material and media validator plays a role in providing an assessment in the form of responses and evaluations that will be used as a basis for revision, so that the material and media created can be developed more optimally. The following are the results of the validation of material and media experts that have been obtained by the researcher after going through the revision stage:

Table 2. Expert validation

No	Validation type	Presentase	Criteria
1	Material Validation	92.1%	Very worthy
2	Media Validation	91.25%	Very worthy

Based on the results of the validation process, it can be concluded that the children's song video clip media obtained a percentage result of 91.6%, which means it is very suitable for implementation in learning activities.

Implementation

The stages carried out after development, namely the implementation stage of children's song video clip learning media. The researcher carried out the implementation stage in the science learning activities in class V of SDN Bringin 02. This stage is divided into 2, namely implementation in small groups with 7 students and implementation in large classes with 20 students. The implementation process is also carried out in two meetings, both in small groups and large groups. In small group learning, media readjustments will be carried out if there are still shortcomings in the media that are felt by students, so that later the learning carried out in large groups will be more optimal. The implementation process of this research is also based on research [26] because it has the same goals for high-grade students, namely grade 5, the research proves that song media remains effective when applied to high grades if the songs that are composed are able to convey material information with lyrics and instruments that are in accordance with the characteristics of children's songs.

Learning at each meeting begins with an apperception process on the food chain material, such as by displaying posters and questions related to the food chain cycle. After that, students are invited to watch a video clip of a children's song on the food chain material and sing it together, from this process the children's song that is composed can also be assessed as easy listening, because students are able to immediately follow the tune and lyrics according to the song in the video clip. The children's song video clip media is used as a basis for the next learning scenario, namely, working on LKPD in groups. After completing the LKPD, each group presents the results of their group work in front of the class, thus training their public speaking skills. In addition, the children's song video clip media that is implemented is also used as a benchmark for improving learning outcomes through the pretest and posttest activities carried out. The children's song video clip media applied in this learning scenario is an effort to apply audio-visual media aimed at maximizing the learning experience of students by involving several of their senses, so that the learning outcomes obtained can also increase.

Evaluation

From the implementation stage that has been carried out, the researcher then continues the evaluation stage, which is aimed at analyzing the effectiveness of the children's song video clip media that has been developed through several assessment instruments. The main assessment used as the level of success of using this media is the results obtained from the pretest and posttest, the results of the two tests are compared to see the impact of using children's song video clip media on the science learning of the food chain material that has been carried out. Data from the pretest and posttest results obtained are then processed and analyzed through normality tests, homogeneity tests, paired t-tests, and N-Gain tests with the aim of seeing the significance of increasing students' understanding of the food chain material through the media used. In addition, the assessment is also carried out through the distribution of response questionnaires, which aim to measure the involvement of the media in improving learning outcomes and students' enthusiasm for learning.

Table 3. Table of average values

Group	Score	N	Mean
Small group	Pretest	7	73.57
	Posttest	7	84.29
Large group	Pretest	20	70.25
	Posttest	20	80.75

Table 3 shows the average pretest and posttest scores from small and large groups. In the small group, it can be seen that the average pretest score was 73.5 and increased to 84.3 in the posttest results. While in the large group, the average pretest score was 70.25 and increased to 80.75 in the posttest results. From these data, it can be concluded that the implementation of children's song video clip media has an impact on increasing the average pretest and posttest scores in small and large groups.

Table 4. Table of normality test

Group	Score	Shapiro-Wilk	
		Sig.	α
Small group	Pretest	0.482	0.05
	Posttest	0.294	0.05
Large group	Pretest	0.076	0.05
	Posttest	0.147	0.05

Table 4 shows the data of the normality test results of the pretest and posttest values in the small group and the large group. From the Shapiro-Wilk normality test that has been conducted, it can be seen that in the small group, the significance value obtained in the pretest is 0.482 and 0.294 in the posttest, while in the large group, it is 0.076 in the pretest and 0.147 in the posttest. From the results of the normality test, the pretest and posttest values in both the small and large groups are greater than 0.05, which indicates that the data is normally distributed.

Table 5. T-test table

Group	Mean	t	df	Sig. (2-tailed)
Small group	Pretest (73.57) Posttest (84.29)	-15,00	6	0.000
Large group	Pretest (70.25) Posttest (80.75)	-11,92	19	0.000

Table 5 shows the Paired Samples Test results from the pretest and posttest in small and large groups. In the small group, it can be seen that there is an increase in the mean of the pretest posttest results from 73.57 to 84.29, while in the large group, a mean of 70.25 was obtained from the pretest and 80.75 from the posttest, this indicates an increase that occurs due to the treatment and intervention that has been carried out. The Sig. (2-tailed) value or significance of 0.000

obtained in the small and large groups proves a significant difference between the pretest and posttest, because the significance value is less than 0.05. The result on this test same as in the research [13] which proves that song media is able to increase interest and learning outcomes through tests that have been carried out, namely pretest and posttest data processed using SPSS shows a calculated t value > t table (9.046 > 2.004) and the significance value obtained is 0.000 < lt; 0.025.

Table 6. Table of N gain test

Group	Mean	Mean diff.	N-Gain	N Gain criteria
Small group	Pretest (73.57) Posttest (84.29)	10.72	0.4170	Medium
Large group	Pretest (70.25) Posttest (80.75)	10.5	0.3617	Medium

Table 6 shows the data of N-Gain test results from pretest and posttest in small and large groups. In the small group, the N-Gain value obtained was 0.4170, while in the large group, the N-Gain value obtained was 0.3617. From the results of the N-Gain test that has been conducted, it can be concluded that the values obtained in both small and large groups indicate the effectiveness of learning in the medium category, this is because the N-Gain test values obtained in both small and large groups are in the range of 0.3-0.7.

The results of the study showed that the implementation of children's song video clip learning media was able to provide a significant impact on students' understanding of the food chain concept material, so that an increase in learning outcomes could also be realized. The increase that occurred was proven by the results of the pretest and posttest, which showed a significant increase in scores in both small and large groups. In the small group, the average pretest score obtained was 73.57 and increased to 84.29 in the posttest results, while in the large group, the average pretest score obtained was 70.25 and increased to 80.75 in the posttest. A significant increase occurred after the implementation of the media developed by the researcher, namely, children's song video clips. This increase shows the effectiveness and success of utilizing children's song video clips as a medium in learning science for class V food chain material. The results of the implementation of children's song video clip media in this research are also in line with the song media in science learning on the water cycle material for grade V with results showing that there was an increase in student motivation and learning outcomes, namely the presentation of motivation increased from the category of quite good to very good, while learning outcomes increased from an average value of 60.95 to 86.67, the details of which were 93% of students exceeded the minimum criteria and were declared to have completed learning with 42 students who were used as research subjects in the research of [27].

The children's song video clip media that has been developed in this study is based on audio-visual media containing animated clips that are arranged into a complete video form and accompanied by children's songs about the food chain material. This media is arranged based on innovations from song media that are usually also found in learning activities, but are collaborated into a more interesting video form and cover a wider learning sector of students, this is in line with the theory of Sampierpi, n.d in [12] which explains that the application of animated videos in the learning process is more effective when compared to the application of learning models without using animated videos, because the presence of animated videos can increase the interest and activity of students in the learning process. The animated content of the clips contained in this media can help students realize the concept of the food chain contained in the lyrics of the song being sung, so that the level of understanding obtained will be more optimal and proven by the increase in learning outcomes obtained. This media is also designed according to the characteristics of grade V elementary school students, namely by using attractive and colorful animations in the video, as well as lyrics that are easy to understand and also instruments that have a happy nuance.

Based on the results of the media implementation that has been done, it proves that learning media can provide a significant impact on learning activities. This also occurs in the implementation of children's song video clip media according to this study, the media provides a more enjoyable learning experience and still prioritizes the main objectives that have been determined, namely improving student learning outcomes. In this study, the media development process was carried out based on the ADDIE model, which consists of five stages, that is:

1. Analysis of problems and needs of teachers and students in the learning process.
2. Designing the design of children's song video clip media by adjusting the material and learning needs.
3. Development of children's song video clip media, consisting of the process of composing song lyrics and making animated videos.
4. Implementation process through small group and large group trials with the aim of measuring the level of media effectiveness to improve understanding and learning outcomes.
5. Evaluation process through several tests to determine the level of media success in improving the learning outcomes of science on food chain material.

Overall, this study was able to show the results that children's song video clip media has a high level of effectiveness in efforts to improve students' understanding of the food chain material in science learning. Through the validation, implementation, and testing stages that have been carried out, it can be concluded that this children's song video clip media is very suitable for use in the learning process and has proven its success. The implication of this study is that children's song video clip media that has been developed based on audio-visual media can be used as a solution in improving students' understanding of the material, this media has also been proven to be able to increase students' enthusiasm for learning and bring a more enjoyable learning atmosphere, so that learning outcomes are obtained, especially on the food chain material in science learning.

Conclusion

This study shows that the development of children's song video clip media using the ADDIE development model is able to achieve success in improving student learning outcomes on food chain material in science learning. This is

evidenced by the increase in student learning outcomes in small groups from an average of 73.57 to 84.29 and in large groups from an average of 70.25 to 80.75. This media has also been proven to be feasible to use, with the results of validation by material experts with a percentage of 92.1% and media experts with a percentage of 91.25%. Therefore, it can be concluded that the application of children's song video clip media is able to improve science learning outcomes, especially on food chain material in grade V.

Author's Contribution

Bijak Samuel Wijaya: contribution includes making media, conducting research, analyzing data, and preparing manuscripts. Eka Titi Andaryani: contributed in the form of media design and reviewed the results of the research article.

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