Animated Powtoon-Based Video to Improve the Ability to Understand Sound Science

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Abstract: Sound is one of the most critical components of singing. A lack of sound understanding can affect students' ability to sing due to the lack of use of learning media in class. The study aimed to determine the effectiveness and feasibility of Powtoon-based animated video learning media on singing abilities in third-grade students using the 10-step Research and Development (R&D) research method developed by Borg and Gall. Data collection techniques using observation, interviews, questionnaires, and documentation. The results of product data analysis in the form of learning media validation were carried out by experts in the field of materials and media with a percentage of 83.75% and 87.5% with the criteria of "very feasible." The effectiveness of the developed media is known based on the increase in the percentage of students' pretest and posttest scores on the knowledge aspect of 0.43% in the "moderate" category and 0.31% in the skills aspect in the "moderate" category. The results of the teacher and student response questionnaire to the media obtained a percentage of 79.57% with the "very decent" criteria. Based on this, portion-based animated videos can improve students' sound understanding and ability to sing and are suitable for use as a support for the learning process in elementary schools.

Keywords: Animated; Powtoon-Based Video; Sound Science; Understand

Introduction

Cultural Arts and Crafts (SBdP) is one of the subjects that must be taught in elementary schools. SBdP can improve students' abilities in the arts (Rantamsih et al., 2021). SBdP can improve students' abilities in the arts. SBdP subjects are essential to teach elementary school students because they can help students to express themselves, be creative, and appreciate the approaches: "learning with art," "learning through art," and "learning about art" (Widaningsih, 2016). At SDN 1 Depok, SBdP is included in learning, which in fact, there are various problems in the implementation of aspects of the art of music.

SBdP learning shapes students' pleasant personalities by paying attention to children's developmental needs in achieving various bits of intelligence, including intrapersonal, interpersonal, visual-spatial, musical, linguistic, mathematical, naturalist and adversity intelligence, creativity, spiritual and moral, and emotional intelligence (Axel & Rizal, 2021).

Based on observation activities carried out by researchers through observations of teaching and learning activities of teachers in class. The researcher found that some students had difficulty singing in 2/4 time and 3/4 time and clapping, between clapping and singing out of harmony, and some students sang with inaccurate tones and lyrics. Based on the results of these observations, the researcher found that the student's ability to sing still needed to improve. Even though students' understanding of music can help students stimulate brain intelligence (Wahyuningsih, 2020) and one of the abilities in music is the ability of students to sing.

Studying music is part of art and culture education, in which several learning components can influence the implementation of music learning (Gunara, 2016).

According to Utomo, music art education is part of the SBdP subjects in SD/MI; with this, it is hoped that students will have the ability to control vocal processing, use musical instruments, enjoy music composition, and develop skills that cover all aspects of life skills that includes personal, social, vocational, and academic skills (Fitri Urvia, 2016).

One of the most critical components in the art of music is sound (Widiyati, 2022). The beauty of music is in rhythmic sounds, tones, and a friendly person to create harmony in sound, words, movements, and behavior (Saputri, 2021). Sounds can be produced from vibrating objects caused by touching, hitting, or something else. Sounds can also be produced by the human body, for example, clapping hands, thighs, picking fingers, stomping feet, etc. When arranged, a collection of these sounds can form a particular pattern that can be used as an accompaniment to the song being sung.

Learning the art of music in elementary schools will only be achieved with a teacher as an educator who provides teaching, education, and motivation to students (Hennessy, 2000). A teacher can lead learning effectively and efficiently and play an active role in it (Rukhani, 2020). Teachers are expected to be able to change the way teaching is planned and delivered, act, and position themselves as professionals who meet the growing need for better student learning outcomes (Arsyad & Sulfemi, 2018).

However, in practice, researchers found that student learning outcomes had yet to achieve the expected results from the results of observations and interviews. The lack of students' understanding of music can be seen from the learning outcomes of class III students at SDN 1 Depok; some students still need to achieve a KKM score 75. This was evidenced by the completeness of the daily assessment of students; only 13 students passed out of 29 students, with a percentage of 45%.

Based on the conditions found, the authors propose a solution to overcome the situation in class III students by using instructional media to support students' understanding of music material and improve students ability to sing.

Learning media is a tool that can be used in learning to generate thoughts, feelings, attention, and skills or abilities to enhance the learning process (Tafonao, 2018). Learning media also has practical uses and impacts on learning, including the ability to explain and present information to accelerate and improve student learning processes and outcomes. Media use in the learning process can increase and control students' attention while creating motivation to learn (Riswalkam & Hafiz, 2020).

The use of animated videos in the learning environment is beneficial in improving student learning outcomes. This is supported by Vernom's concept, which states that integrating audiovisual technology into learning can improve learning abilities by 50% compared to no media (Widiastuti, 2018). The use of audiovisual technology is also highly recommended in classroom teaching (Smaldino et al., 2012).

Teaching materials suitable for use in elementary schools are adapted to the characteristics of elementary school students, such as they still like to play, move, imitate, feel, and do things directly and work in groups (Lukman et al., 2019). Media use in learning can attract attention and motivate students to actively participate in learning activities, including using learning media in the form of animated videos. Using animation is also able to help students remember and understand the material (Rangga Lawe et al., 2020). Presenting videos and films will assist teachers in conveying information and ideas to their students.

Animation techniques in improving student learning outcomes are more effective than traditional learning methods (Aksoy, 2012). Animated videos combine text, graphics, and audio into one movement. The increasingly diverse choice of software can create potential new directions, but selecting the appropriate software and developing effective teaching methods, such as Powtoon, offers cloud-based software for creating short animated videos (Nanni, 2015). Powtoon is an online application for creating animated videos. It has various features such as handwriting animation, cartoon animation, and more animated transition effects, as well as elementary timeline settings (Ponza et al., 2018).

Powtoon can increase motivation to create interactive material with animations and videos (Pais et al., 2017). Dimas believes that Powtoon-based learning animation videos are animated cartoon videos that can be filled with topics and used as learning media for elementary schools because they are attractive, fun, and suitable (Dimas & Wicaksono, 2019).

In this Powtoon-based animated video, the characters in the video will invite students to learn how to sing in 2/4 time and 3/4 time and clap, as well as videos of singing while clapping with instrument accompaniment to improve students' ability to sing. There are examples of 2 nursery rhymes in 2/4 time and 2 nursery rhymes in 3/4 time. Children's songs are chosen because the forms of children's songs are mostly simple, and the theme is the spirit of the children. The text is short, and the language is simple and easy to understand (Subekti, 2010). The musical soundtrack can affect the emotional impact. Interpreting and remembering visual information (Boltz et al., 2009).

Endrawara revealed that children's songs are cheerful and reflect noble ethics (Ardipal, 2015).

Based on the results of the needs questionnaire, it was concluded that the media developed was packaged in the form of a FlashDisk. The advantage of Powtoon-based animated video media is that students don't feel bored and sleepy because students are not only fixated on the text but are shown moving animations that can increase enthusiasm for learning and improve student learning outcomes.

The developed learning media has benefits for its users, including 1) Sound material is explained sequentially so that it is easy to understand, 2) Learning media can be accessed via YouTube so that it helps students when students study independently, 3) some pictures match the material for help students understand the material, 4) There is a video on how to sing and clap correctly, 5) The animation in the video is moving, and the primary color of the video is bright so students don't feel bored.

Method

Researchers apply research and development (Research and Development), which emphasizes that the resulting product can be either new or existing goods then developed. Researchers make products in animated video learning media to be used in learning.

This research and development applies the Borg and Gall model modified by Sugiyono, which consists of 10 steps, namely (1) Potential and Problems, (2) Data Collection, (3) Product Design, (4) Design Validation, (5) Design Revision, (6) Initial Test, (7) Product Revision, (8) Usage Trial, (9) Product Revision, and (10) Mass Production (Sugiyono, 2015). The product in this study is only for class III students at SDN 1 Depok. Researchers carried out research in semester 2 from March to April 2023. Class III students at SDN 1 Depok, with a total of 29 students, were the subjects of this study. Collecting data for research conducted by researchers using various instruments such as observation, interviews, questionnaires, and documentation.
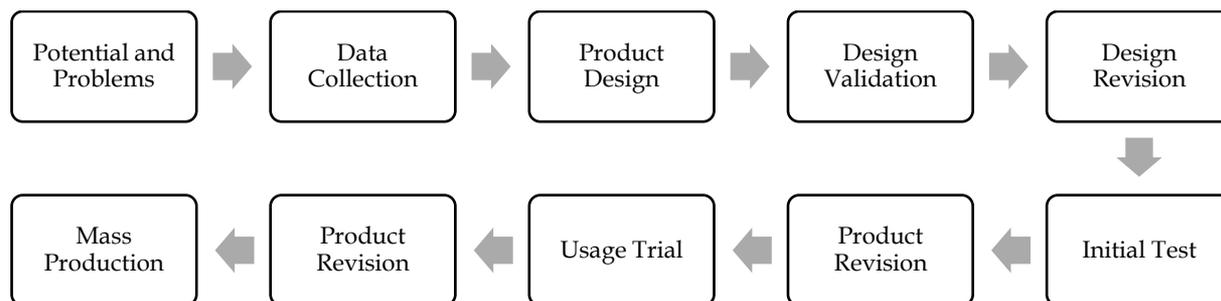

Figure 1. R&D Research Stages

The average results obtained from the questionnaire are then categorized into specific categories. The score calculation uses an assessment instrument with the formula 1 (Purwanto, 2013).

$$NP = \frac{R}{SM} \text{ X } 100\% \qquad (1)$$

The percentage results from the questionnaire are then used as a reference for the feasibility and effectiveness of Powtoon-based animated video learning media in learning with the following conversion criteria (Purwanto & Ngalim, 2017). Assessment of student learning outcomes on aspects of knowledge and aspects of skills is calculated using the following scoring formula 2.

$$Score = \frac{Gain\ Score}{Max\ Score} x\ 100 \qquad (2)$$

Table 1. Assessment result criteria

Percentage (%)	Criteria
76-100	Very Worth It
51-75	Worth It
26-50	Enough
0-25	Not Worth It

Data analysis was conducted to determine the effect of using the Powtoon-based animated video developed on the average student learning outcomes based on the pretest and posttest calculated using the gain index. By using the N-Gain formula 3 (Lestari & Yudhanegara, 2017).

$$N\text{-}gain = \frac{Posttest\ Score - Pretest\ Score}{Max\ Score - Pretest\ Score} \qquad (3)$$

The results of these calculations are then categorized according to the following criteria for the N-Gain test results (Lestari & Yudhanegara, 2017).

Table 2. Criteria for N-Gain Test Results

Coefficient Intervention	Criteria
N-gain < 0.3	Low
0.3 ≤ N-gain < 0.7	Currently
N-gain ≥ 0.7	Tall

Result and Discussion

Developed product specifications

The product produced in this research and development is a Powtoon-based animated video with sound material. Animated videos are developed using the Powtoon software accessed via the web using a laptop. The media design developed is made attractive according to the character of students and the material in elementary schools. Some pictures and videos in the media support the material, such as how to sing accompanied by proper clapping. The language used is communicative and easy to understand.

Powtoon-Based Animated Video Development

The process of developing a powtoon-based animated video is carried out using 10 steps in the Research and Development (R&D) method, namely, 1) Potential and Problems, 2) Data Collection, 3) Product Design, 4) Design Validation, 5) Design Revision, 6) Initial Test, 7) Product Revision, 8) Usage Trial, 9) Product Revision, and 10) Mass Production. The following is an explanation of the stages in the research that has been carried out.

Potential and Problems

The initial step researchers take to find potential problems is to carry out observation activities. Observations were made to find problems and collect data. Observation activities were carried out on October 3, 2022, in class III at SDN 1 Depok. From the observations, the problem was a lack of understanding and the use of learning media used by teachers in teaching and learning activities.

Data Collection

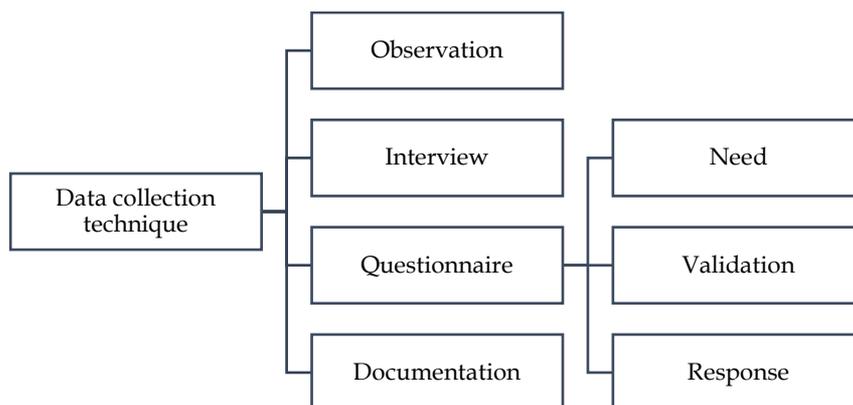Data collection techniques carried out by researchers include the following.

Figure 2. Data collection technique

Observation

Observations made by researchers on October 3, 2022, by observing the process of ongoing learning activities in class. This observation activity results from the need for more understanding of sound and the lack of use of learning media.

Interview

To obtain information on sound comprehension, the researcher conducted interviews with the teacher and several grade III students at SDN 1 Depok.

Questionnaire

The questionnaire used by researchers in the process of developing the media was a needs questionnaire intended for teachers and students in class III at SDN 1 Depok, a validation questionnaire for material experts and media experts, as well as a questionnaire for the responses of teachers and students for class III at SDN 1 Depok.

Documentation

Documentation in this study is in the form of pictures taken by researchers in learning activities and student learning outcomes.

Product Design

Animated video learning media was developed using the Powtoon application, accessed via the web. The media developed contains videos on producing

sounds according to 2/4 time signature and 3/4 time signature by clapping, children's songs, examples of singing with correct and correct hand clapping accompaniment, and practical assignments for students. Powtoon-based animated videos are packaged in flash drives and uploaded to the YouTube application, which can be accessed.

Design Validation

Design validation or assessment of the learning media developed is carried out by material expert lecturers and media experts.

Material Expert Validation

Material validation is carried out by expert lecturers in the field of music to determine the feasibility of the media in the aspects of material relevance, aspects of the learning process, aspects of language, and aspects of the presentation. The following are the results of design validation by material expert lecturers.

Table 3. Material Expert Validation Results

Indicators	Percentage %	Criteria
Material Relevance Aspects	87.50	Very Worth It
Aspects of the Learning Process	85.00	Very Worth It
Language Aspect	75.00	Worth It
Presentation Aspects	87.50	Very Worth It
Average	83.75	Very Worth It

Media Expert Validation

Media validation is carried out by expert lecturers in the field of technology to determine the quality of media display in aspects of presentation, media design, media content, and media feasibility. The following are the results of media validation by media expert lecturers.

Table 4. Media Expert Validation Results

Indicators	Percentage (%)	Criteria
Presentation Aspects	75.00	Worth It
Media Design Aspects	93.75	Very Worth It
Media Content Aspect	93.75	Very Worth It
Media Feasibility Aspect	87.50	Very Worth It
Average	87.50	Very Worth It

Initial Test

After material experts and media experts validated the media, product trials were carried out in small groups with 5 class III students at SDN 1 Depok. The Powtoon-based animated video learning media trial was carried out with the help of flash drives, projectors, laptops, and pretest-posttest questions. If, from the results of the trial in the small group, there is no deficiency or an increase, then it is continued with the trial use in the larger group. The following are the results of the initial trials in small groups in the form of pretest and posttest in small groups.

Table 5. Knowledge Aspect Preliminary Trial Results

Information	Pretest	Posttest	N-Gain Value	Criteria
Average	61	84	0.44	Currently

Based on the table 5, there is an increase in the average learning outcomes of students' knowledge aspects after using Powtoon-based animated video learning media. The average value of the pretest and posttest increased by 0.44 in the moderate category.

The developed learning media is used to improve student learning outcomes in the knowledge aspect and to improve students' skills in singing and clapping properly. The following are the results of initial trials on small groups of skills aspects.

Table 6. Results of the Initial Test on the Skills Aspect

Information	Pretest	Posttest	N-Gain Value	Criteria
Average	51.52	77.50	0.51	Currently

Based on the table 6, the average value of students in the skill aspect has increased by 0.51 in the moderate category after applying Powtoon-based animated video learning media. The results of the response questionnaire given to small group students obtained a percentage of 55.8% with feasible criteria. Based on these results, the developed media can improve students' understanding of sound in the knowledge and skill aspects. This proves that Powtoon-based animated video learning media is practical and feasible to be applied on a larger scale.

Trial Usage

After the initial trials were carried out in small groups and it was obtained that there was an increase in the average scores of students in the knowledge and skills aspects, then the products developed were tested for use in larger groups. Trial use in large groups with 24 class III students at SDN 1 Depok.

Product use trials in large groups were carried out with the help of flash drives, projectors, laptops, and

pretest-posttest questions. The results of the trial are used in large groups as pretest and posttest aspects of knowledge.

Table 7. Results of Testing the Use of Aspects of Knowledge

Information	Pretest	Posttest	N-Gain Value	Criteria
Average	60.42	87.5	0.43	Currently

Based on the table 7, it can be interpreted that there is an increase in the average learning outcomes of students' knowledge aspects after using powtoon-based animated video learning media. The average value of the pretest and posttest increased by 0.43 with moderate criteria The following is the result of testing the use of the product on a large group of skills aspects.

Table 8. Results of Testing the Use of Skills Aspects

Information	Pretest	Posttest	N-Gain Value	Criteria
Average	56.25	81.51	0.31	Currently

Based on the table above, it can be interpreted that the average value of students in the skills aspect has increased by 0.31 with moderate criteria after applying Powtoon-based animated video learning media. The results of the response questionnaire given to students obtained a percentage of 85% with very decent criteria, and the teacher's response questionnaire results were 75% with feasible criteria.

The developed Powtoon-based animated video learning media is effective after undergoing the trial stages on small-scale and large-scale trials (Kurniawati et al., 2021). In addition to using student learning outcomes in terms of knowledge and skills aspects, the results of the teacher's response questionnaire and student response questionnaire were also used to determine the success of the media being developed. This proves that animated video learning media has succeeded in helping students understand sound.

Deploymebt Production
Powtoon-based animated video learning media products developed are only intended for teachers and grade III students at SDN 1 Depok.

Conclusion

Based on the results of research and development of Powtoon-based animated videos that have been carried out using the R&D research method developed by Borg and Gall with 10 steps, namely: (1) Potential and Problems, (2) Data Collection, (3) Product Design, (4)) Product Validation, (5) Design Revision, (6) Preliminary Testing, (7) Product Revision, (8) Usage Trial, (9) Product Revision, and (10) Mass Production, it can be concluded that Powtoon-based animated videos for improving scientific understanding of the nature of sound are an animated video designed according to the needs of teachers and students to improve student learning outcomes in both the knowledge and skills aspects. The developed media is valid based on the results of the average percentage of assessment from material experts of 88.75% and media experts of 87.5%, with a very decent category. These results indicate that the developed media can be applied to learning in elementary schools. The developed media was adequate based on the average student learning outcomes in terms of knowledge and skills aspects. Based on the average results of the pretest and posttest in class III SDN 1 Depok, the knowledge aspect was 60.42% to 87.5% and experienced an increase of 0.43% in the "medium" category. In contrast, in the skill aspect, it was 56% to 81, 51%, and an increase of 0.31% in the "medium" category. And based on the teacher and student response questionnaires results, Powtoon-based animated videos obtained a percentage of 79.57% in the very decent category.

Author Contributions
Nur Faridatus Solehah, as the first author, contributed to collecting data by conducting direct research in the field, media development, and field trials. In addition, Nur managed the data obtained from several questionnaires on the needs of teachers and students, small group and extensive group trial data, and teacher and student responses to the products produced. The first author also analyzed data before reporting research results through scientific writing. As the second author, Deni Setiawan contributed to developing and evaluating the feasibility of the media before being tested and validated by two experts. In addition, it plays a role in strengthening the teacher, student, and expert validation instruments involved. Other roles are managing research results, strengthening data analysis, and participating in publication activities.

Conflicts of Interest
We declare that the authors in this article do not have a conflict of interest with anyone, either individual or any institution. We are writing as part of reporting research activities and contributions to science.

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