Interactive Powerpoint Learning Media on Science Content for Fifth Grade Elementary School

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ABSTRACT

Teachers who do not package appropriate learning models and media for science learning so that students find it challenging to learn. This study aimed to develop a PBL-based video. This type of research is developed using the ADDIE model. The research subjects were one content expert, one learning design expert, and one learning media expert. The test subjects were 3rd-grade students for individual trials, nine small group trials, and 27 people for field trials. Methods of data collection using questionnaires or questionnaires. The data collection instrument used a rating scale instrument. Data analysis techniques are qualitative descriptive statistical analysis, quantitative descriptive statistical analysis, and inferential statistics. The results of the analysis, namely the validation of media experts, obtained a percentage of 93.33% (very good), material experts 98.68% (very good), and design experts 89.70% (very good). The individual test results were 93.33% (very good), the small group trial was 95% (very good), and the field test was 94.35%. Based on the results of the analysis that the significance level is less than 0.05 (p<0,05). Thus, it can be seen that there is a significant difference in student learning outcomes for science content before using PBL-based learning videos. It is concluded that PBL-based learning videos improve student learning outcomes.

1. INTRODUCTION

Currently, the world is in shock with the covid-19 virus outbreak, which can cause death, so one must be aware of this virus. This very dangerous Coronavirus has an impact on all community activities (Lyócsa et al., 2020; Shah et al., 2020). Covid-19 also affects all aspects of human life, especially education (Batubara & Batubara, 2020; Yulia, 2020). It has caused the government to make new regulations, namely that everyone does not do activities outside or inside the house in groups to reduce the spread of COVID-19. In addition, learning activities must also be carried out at home so that students are not infected with this disease (Kadafi et al., 2021; Tamboto et al., 2021). It causes learning activities to be carried out online.
Learning activities must continue to be carried out so that the quality of human resources is maintained properly (Ahmad & Triastuti, 2021; Dewantara & Nurgiansah, 2020). Superior human resources are one of the requirements to build the Indonesian nation to be more advanced. If the Indonesian nation already has superior human resources, it can advance the Indonesian nation quickly (Hidayah et al., 2020; Syarifuddin, 2020). An appropriate learning approach is needed for students in thematic learning to achieve maximum learning objectives.

Thematic learning involves several fields of study that aim to provide meaningful experiences for students because they relate to a theme (Pratama et al., 2020; Suryaningsih & Rimiati, 2018). Learning with real themes invites students to understand the concepts learned through direct experience and connect concepts they have understood (Desyandri et al., 2019; Wuryani & Yaminah, 2018). This thematic learning is one of the integrated learning that provides meaningful experiences to students to create a learning environment that encourages full student involvement in learning (Dewi & Rukmini, 2019; Laksana et al., 2019). Thematic learning also requires students to be active in learning and able to solve a problem according to their abilities. In learning activities, students can do learning by playing. It can lead to high creativity so that students can integrate their knowledge and skills using the theme (Haifaturrahmah et al., 2020; Syarifuddin, 2017). One of the contents contained in the theme is learning science. Science in elementary schools can be a vehicle for students to study nature and apply it in students’ lives (Diartha et al., 2019; Stiawan et al., 2017). In science learning activities, students focus more so that learning activities become more active and fun (Hairida, 2016; Nanda et al., 2017). It causes science learning to be packaged properly with an appropriate learning approach so that it can help students understand learning to the fullest.

However, in reality, many teachers do not package appropriate learning models for science learning, so students find it difficult to learn (Anif et al., 2020; Kusumayuni & Agung, 2021). Some students do not like science learning because students feel bored with the learning model used by the teacher (Arisantiani et al., 2017; Suantara et al., 2019). Learning activities with teacher-centered science learning lead to less than optimal learning outcomes obtained by students (Wardani & Syofyan, 2018; Widiartini et al., 2019). Based on observations made in the fifth grade of SD N 5 Patemon, problems were found in theme 7 sub-theme 1: learning activities are not associated with daily life, so students have difficulty understanding learning materials. In addition, learning activities are also still teacher-centered, causing students’ low thinking and learning objectives not to be achieved optimally. In the 2013 curriculum, learning activities require students to be active in learning so that an appropriate learning process occurs. If learning is teacher-centered, students only passively listen to the teacher’s explanations, and students’ thinking skills become less developed. In addition, the lack of interaction between teachers and students resulted in a less effective learning atmosphere. The lack of learning media is also the main cause of students’ difficulties in learning science, resulting in learning outcomes below the Minimum Completeness Criteria. The data analysis showed that of the 27 total students, seven were completed (20%) while 20 had not completed (80%). If these problems are left unchecked, they will harm student learning outcomes.

The solution to these problems is using learning media based on an appropriate learning approach for students. One of the suitable media for science learning is a problem-based learning video. PBL-based video is very suitable because it is flexible and easy to use. The use of video media will attract attention so that it can support a fun learning process (Hikmah & Purnamasari, 2017; Maryanti & Kurniawan, 2018). This video can also improve critical thinking in students because it is PBL based. PBL is a learning approach that exposes students to real problems to help them better analyze a problem (Nurtanto et al., 2019; Zhou, 2018). This learning activity can make students more active in learning because it can stimulate critical thinking skills so students can solve problems correctly (Ballesteros et al., 2019; Primayanti et al., 2019). The problems presented in this video are in digital format so that the problems presented can be accessed anywhere. Video media has a function that can direct and help concentration when participating in learning activities (Prietini, 2020; Putri et al., 2020). Videos can also accelerate the achievement of learning goals because students can easily remember the message conveyed in the video (Lukman et al., 2019; Muliani & Wibawa, 2019). In addition, another benefit of video is that it helps you visualize the meaning of the message more clearly to allow maximum student mastery (Kurniawan et al., 2018; Widiasanti et al., 2018). Using media and selecting appropriate models can help students who do not understand the material easier to learn.

The findings of previous research stated that video was very suitable to be used because it follows students’ character so that they were very interested in participating in learning activities (Nanda et al., 2017; Putri et al., 2020). Other research findings also state that videos presented in colors that are liked by students and interesting can increase students’ motivation (Ponza et al., 2018; Widiarti et al., 2021). Other findings also state that the PBL-based learning approach can improve students’ critical thinking (Argaw et
There is no study on PBL-based videos on theme 7 for fifth grade. The advantages of learning videos that will be developed are that these videos will present appropriate material and animations that can stimulate students in learning. It is what causes videos to help students who are slow in capturing messages become easier to accept the information conveyed by the teacher. In addition, this video can also train students to solve problems so that they can improve their critical thinking in students. This study aims to develop a PBL-based video on Theme 7 for fifth-grade elementary school. It is hoped that PBL-based videos will help students learn.

2. METHOD

This research uses the ADDIE model, including analysis, design, development, implementation, and evaluation (Tambunan & Sundari, 2020). The analysis phase is problem analysis. The design stage is done by designing the media. The development stage is carried out to develop PBL-based videos. The implementation phase is used for product testing on students. The evaluation stage is to test the effectiveness of the PBL-based video. The research subjects are one content expert, one learning design expert, and one learning media expert. The trial subjects were fifth-grade students, totaling 3 for individual trials, 9 for small group trials, and 27 for field trials at SD Negeri 5 Patemon. The data collection method in this study used a questionnaire or questionnaire. Questionnaires are used to collect data in the form of input or scores from experts. The data collection instrument in this development research used a rating scale instrument. The instrument grid is presented in Table 1 and Table 2.

Table 1. Material Expert Instruments

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kurikulum</td>
<td>The suitability of indicators with Basic Competencies, Objectives with indicators, and materials with objectives</td>
</tr>
<tr>
<td>Contents</td>
<td>The breadth and depth of the material</td>
</tr>
<tr>
<td></td>
<td>The suitability of the material with the characteristics of students</td>
</tr>
<tr>
<td></td>
<td>Material Interest</td>
</tr>
<tr>
<td></td>
<td>Precise examples to explain</td>
</tr>
<tr>
<td></td>
<td>The suitability of the questions given</td>
</tr>
<tr>
<td></td>
<td>The adequacy of the examples given</td>
</tr>
<tr>
<td></td>
<td>The suitability of images, videos, and animations to clarify the content</td>
</tr>
<tr>
<td>Language</td>
<td>Conformity with the rules of the Indonesian language</td>
</tr>
<tr>
<td></td>
<td>The language used follows the characteristics of students.</td>
</tr>
<tr>
<td></td>
<td>Spelling accuracy on the material</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Clarity of problem formulation and level of difficulty of questions following competence</td>
</tr>
</tbody>
</table>

Table 2. Media Expert Instruments

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>The cover design is attractively made.</td>
</tr>
<tr>
<td></td>
<td>The letters used on the cover are attractive and easy to read.</td>
</tr>
<tr>
<td></td>
<td>The cover illustration describes the contents/materials of teaching materials.</td>
</tr>
<tr>
<td></td>
<td>The font size for the title of teaching materials is more dominant and proportional than other font sizes.</td>
</tr>
<tr>
<td></td>
<td>Title color match</td>
</tr>
<tr>
<td>Audio</td>
<td>The narrator's voice is clear.</td>
</tr>
<tr>
<td></td>
<td>Music compatibility in video</td>
</tr>
<tr>
<td></td>
<td>Effect suitability on video</td>
</tr>
<tr>
<td></td>
<td>Intonation match</td>
</tr>
<tr>
<td></td>
<td>Size, Sharpness, Exposure of images and animations</td>
</tr>
<tr>
<td></td>
<td>Clear font display</td>
</tr>
<tr>
<td></td>
<td>Layout/appearance of images, videos, and animations that are presented proportionally</td>
</tr>
<tr>
<td></td>
<td>Interesting video images and animations</td>
</tr>
</tbody>
</table>

(Candra Dewi & Negara, 2021)
The data analysis techniques used in this development research are qualitative descriptive statistical analysis, quantitative descriptive statistical analysis, and inferential statistics. This study used qualitative techniques to process data in the form of criticism, suggestions/input, and responses to the results of expert reviews regarding the developed video media. Quantitative techniques describe the average score of each expert regarding the developed learning video media. To make decisions about the meaning of the material, design, media, and student expert test validation instruments, use the five-scale achievement convention (Tegeh, I. M., & Kirna, 2013). The inferential statistical analysis technique was used to determine product effectiveness on student learning outcomes at SD Negeri 5 Patemon before and after using the product development of learning video media.

3. RESULT AND DISCUSSION

Result
This development research produces media products in the form of problem-based learning videos on theme 7, especially on science content carried out in fifth grade at SD Negeri 5 Patemon using ADDIE. First, analysis. The analysis results are on theme 7 sub-theme 1, namely that learning activities are not associated with daily life, so students have difficulty understanding the learning material. In addition, learning activities are also still teacher-centered, causing students' low thinking and learning objectives not to be achieved optimally. In the 2013 curriculum, learning activities require students to be active in learning so that an appropriate learning process occurs. If learning is teacher-centered, students only passively listen to the teacher's explanations, and students' thinking skills become less developed. In addition, the lack of interaction between teachers and students resulted in a less effective learning atmosphere. The results of the curriculum analysis, namely Basic Competencies and indicators, are presented in Table 3.

Table 3. Basic Competencies and Indicators

<table>
<thead>
<tr>
<th>Basic Competencies</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7</td>
<td>3.7.1 Analyzing the properties of gaseous objects.</td>
</tr>
<tr>
<td>changes in temperature and the shape of objects in everyday life</td>
<td>3.7.2 Analyze yawning events.</td>
</tr>
<tr>
<td></td>
<td>3.7.3 Analyzing condensation events</td>
</tr>
<tr>
<td></td>
<td>3.7.4 Analyzing Changes in the Form of Gases</td>
</tr>
<tr>
<td></td>
<td>3.7.5 Analyzing Freeze Events</td>
</tr>
<tr>
<td></td>
<td>3.7.6 Analyzing Melting Events</td>
</tr>
<tr>
<td></td>
<td>3.7.7 analyzing events requiring and releasing heat</td>
</tr>
</tbody>
</table>

Second, design. The stage of collecting materials is needed to complete and support the content and appearance of the learning video media. The materials collected were in the form of material on theme 7 (Events in Life) on the science content sourced from student books and using animation to convey the contents of the learning video. The problem-based learning video media framework is carried out systematically in compiling materials, animations, pictures, and characters in the learning practice videos. The results of the video design are presented in Figure 1.

![Figure 1. PBL-based Video Design](image)

Third, development. The next stage is the development stage, where the problem-based learning video media is developed into a real product adapted to the design that was made previously. The initial activity carried out at this stage is to collect materials or materials, material that is following the research made where the material will be sought or consulted to the school concerned, each material presented in...
each video consists of several basic competencies. The contents of problem-based learning-based learning videos are material summaries, animations, pictures, and practice videos. The cover video was made using the Wobdershare Filmora X application in making the cover adapted to the fifth grade 7 theme of SD Negeri 5 Patemon and the material from theme 7 specifically on science content. The cover was made as attractive as possible, which aims to attract the attention of potential viewers or students. The results of the development are presented in Figure 2.

![Figure 2. PBL-based video](image)

PBL-based videos are then validated. The results of the validation of media experts obtained a percentage of 93.33% (very good), material experts 98.68% (very good), and design experts 89.70% (very good). Fourth is implementation. The individual test obtained 93.33% (very good), a small group trial that was 95% (very good), and a field test of 94.35%. It is concluded that PBL-based video is valid, so it is feasible to be applied in learning. The results of the expert validation got good qualifications, and the Indonesian word replaced some input from experts, namely the foreign word effort. In the explanation, there were no images of sea breezes in the convection section. The results of the revision are presented in Figure 3.

![Figure 3. Results of PBL-based Video Revision](image)

Fifth is evaluation. At the evaluation stage, it is carried out to determine the results of the prerequisite test. The prerequisite test includes the normality test and the sample T-test, which aims to determine the results of the effectiveness test of fifth graders at SD Negeri 5 Patemon after and before using problem-based learning video media. Based on the results of the normality test for the distribution of the data above, the significance value in the Shapiro-Wilk column gets a value of 0.384 for the pretest and 0.022 for the posttest. This result shows that the significant value in both columns is greater than 0.005. Based on the analysis results, the significance (2-tailed) is 0.000. This result shows that the significance is smaller than 0.05 \((p<0.05)\), so \(H_0\) is rejected, and \(H_1\) is accepted. Thus, it can be seen that there is a significant difference in student learning outcomes of science content before using PBL-based learning videos and after using PBL-based learning video media.

**Discussion**

Based on the results of data analysis, it was found that there was a significant difference in student learning outcomes of science content before using PBL-based learning videos and after using PBL-based learning video media due to the following factors. First, PBL-based videos can improve learning outcomes. This video-based learning has a unique feature that can make learning effective because the method used is PBL-based, which can improve students’ ability to think, especially in thematic learning.
This thematic learning is integrated learning that connects and provides meaningful experiences to students to create a learning environment that encourages full student involvement in learning (Dewi & Rukmini, 2019; Laksana et al., 2019). Thematic learning also requires students to be active in learning and solve a problem according to their abilities (Dessiane & Kristin, 2021; Riani et al., 2019). Digital media can help facilitate learning material to increase understanding (Gaudin & Chaliès, 2015; Sudarma & Sukmana, 2022; Wulandari, 2020). This video leads to better learning outcomes because it supports different student learning styles, especially those with audio-visual learning styles. The advantage of this video is that it presents objects concretely and realistically, so it is very good to add to the student learning experience (Nurrohmah et al., 2018; Ulusoy & Çakiroğlu, 2018). In terms of material presentation, this video presents the material clearly so that students can understand well-structured and systematic material. This video is also able to hone problem-solving skills in students. This learning video is designed according to the indicators and learning objectives so that students will have a clearer understanding of the learning flow. In terms of the explanation aspect, the narration presented in the video is very short and varied, so students can understand the material very well.

Second, PBL-based learning videos can increase enthusiasm for learning. This video-based learning has very interesting features to motivate and involve students in learning activities to increase collaboration between students. Based on the results of using this video during the student learning process, it has its charm because it has different learning activities from before, thereby increasing students’ learning motivation. This video also reduces boredom because it is combined with teaching techniques through discussion of issues shown in videos which will certainly increase students’ memory of the material being studied (Gaudin & Chaliès, 2015; Wulandari, 2020). In terms of the language aspect, the video presents very short sentences but provides important points in learning so that students understand the material more quickly. In addition, in the video, practical assignments aim to hone students’ thinking so that learning activities are more interesting than before, which only used the lecture method. Previous findings also state that problem-solving activities carried out by students can develop students’ thinking skills (Iskandar, 2014; Krisdiana et al., 2018; Marzuki & Basariah, 2015). After students watch the video at the end of the session, students are given an evaluation task by the teacher to measure students’ abilities after participating in learning activities. It is important to measure the achievement of learning activities (Brame, 2016; Laksmi & Suniasih, 2021; Nabirir et al., 2019). In learning activities, students can do fun learning that can lead to high creativity so that students can integrate their knowledge and skills using the theme (Haifaturrahmah et al., 2020; Syafuddin, 2017). Moreover, science learning activities focus more on students so that learning activities become more active and fun (Hairida, 2016; Nanda et al., 2017).

PBL-based video is very suitable because it is flexible and easy to use. The use of video media will attract attention so that it can support a fun learning process (Hikmah & Purnamasari, 2017; Maryanti & Kurniawan, 2018). Other research findings also state that videos presented in colors that are liked by students and interesting can increase students’ motivation (Ponza et al., 2018; Widiarti et al., 2021). Previous research findings stated that video evoked a learning atmosphere (Agustien et al., 2018; Nurdin et al., 2019). Another finding states that combining videos with appropriate models can create interesting learning activities to improve student competence (Kawka et al., 2021; Suryawan et al., 2021). Other findings also state that videos are effective in significantly increasing student achievement (Mayang Ayu Suwani & Aslam, 2021; Muna et al., 2017). It is concluded that video is very necessary for learning activities so that the objectives can be achieved. This research implies that teachers in learning activities can use the developed media because it effectively improves student achievement. In addition, this video can also encourage teachers to use other learning models besides lectures that can activate a pleasant learning atmosphere.

4. CONCLUSION

Both experts and students highly qualify for PBL-based learning videos. Based on the results of data analysis, it was found that there was a significant difference in student learning outcomes of science content before using PBL-based learning videos and after using PBL-based learning video media. It is concluded that PBL-based learning videos improve student learning outcomes.

5. REFERENCES


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