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Development of Powtoon Media in IPAS Learning Assisted by The PBL Model in Fourth Grade Elementary School

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Abstract: Learning is still carried out conventionally, even though school facilities support carrying out learning using renewable technology-based learning media. However, teachers lack innovation in learning media to be used in the learning process. Apart from that, student learning outcomes are still low. This research aims to develop Powtoon learning media assisted by the problem-based learning model in science and science learning in class IV elementary schools that is valid, practical, and effective. This type of research is research and development (R&D). The development model used is ADDIE. The methods used to collect research data are observation, interviews, questionnaires, and learning outcomes tests. Subject validation is carried out by material, language, and media expert validators. The test subjects were Class IV elementary school students and class teachers. The validation results by material, media, and language experts stated that they were valid for the media being developed. The practicality results in both small and large groups obtained a very valid practicality category. Meanwhile, the results of effectiveness tests in small and large groups have increased. In this way, the media developed is declared valid, practical and effective, and suitable for use in science and science learning in Class IV.

Keywords: Instructional media; *Kurikulum merdeka;* Powtoon; Problem based learning

Introduction

The use of technology in the learning process is nothing new in the current era of globalization. Considering that all elements, including education, must follow technological advances (Norita & Hadiyanto, 2021). Learning using technology-based media is often implemented nowadays. Such as the use of multimedia facilities and Internet media in the learning process (Akbar & Noviani, 2019).

The use of renewable technology in the learning process has changed the world of education significantly, such as changes in teaching methods (Hoque et al., 2022). Apart from that, teachers must have the ability to make learning media interesting and renewable. Teachers have a very important role in learning, so they are required to be more creative and innovative (Yoga & Isroani, 2023).

Well-designed learning media will really help students digest and understand the lesson material. Considering that learning media has a crucial role in the learning process. In line with Erita et al. (2022) learning media is one of the fundamental aspects for improving the quality of learning. On the other hand, learning media that is integrated with renewable technology can make learning more enjoyable. Learning that uses digital learning media makes the learning process less monotonous and more varied (Budi & Miaz, 2023).

However, what happened in the field was still far from expectations. Based on the results of a preliminary study that the author conducted at SDN 77/III Mukai Tinggi, SDN 78/III Mukai Hilir, and SDN 169/III Mukai Mudik, which was carried out on 3 July–5 August 2023

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by conducting interviews with teachers and analyzing students about use of learning media. From interviews with teachers, information was obtained that the use of media in learning was very minimal, and teachers usually used media available at school. There is no teacher initiative to develop more interesting and interactive learning media. Even though learning media has a vital role in the learning process. Learning media can foster student passion, enthusiasm, and motivation to learn (Yoga & Isroani, 2023). This situation has an impact on students. As a result, students' understanding of the material is very slow, and many still do not achieve learning objectives. Apart from that, students are also less active in the learning process. Students were mostly silent, and only a few students seemed brave enough to express opinions and ask questions.

The results of an interview with the fourth grade teacher at SDN 77/III Mukai Tinggi on July 3, 2023, showed that the teacher only delivered learning based on the textbooks available at school. In fact, the school has very good facilities, such as the availability of projectors, computers, and wifi at the school. However, these facilities are not utilised properly due to the limited knowledge of teachers in developing learning media. On the other hand, Class IV students at this school already have a close relationship with technology, especially smartphones. Researchers found this out after conducting interviews with students. And ironically, students have not utilised their knowledge about technology for learning.

Based on this preliminary study, it is very appropriate to develop technology-based learning media that are interesting and appropriate to students' abilities. One learning medium that can be developed is Powtoon learning media. The reason for using Powtoon media is because it has the advantage of being a practical way to use it, and students can relearn it repeatedly by accessing it via YouTube, so it can be used at any time. Apart from that, Powtoon media is also in accordance with the facilities owned by the school (Istiqomah & Adi, 2024; Srikan et al., 2021).

To apply it to the learning process. Powtoon media is collaborated with the Problem-Based Learning (PBL) learning model. The PBL model makes students actively involved in the learning process. In the PBL model, there is a collaborative problem-solving process by students, so that students will be actively involved in the learning process (Ramadhani & Shofiyah, 2023). Thus, the application of Powtoon learning media with the help of the PBL model makes the learning process more dynamic and interactive.

Apart from that, based on the findings of research carried out by Asmara et al. (2023) which aims to develop Powtoon-based science learning media in Class IV Elementary School, it was concluded that the use of Powtoon-based learning media can improve student learning outcomes in science learning. This is proven by the completeness of student learning outcomes in one class, which is 90%. Furthermore, research carried out by Saefurrohman et al. (2023) aimed at producing social studies learning media in class IV using Powtoon. The results obtained were that the media developed could improve student learning outcomes (Bungawati & Rahmadani, 2023). This can be seen from the results of the pretest and posttest student learning outcomes. When conducting a pretest on learning outcomes, the overall average score of students was 71.7. During the posttest on learning outcomes, the students' overall average score increased to 87.5. The increase in student learning outcomes based on the pretest and posttest was 15.8%. Thus, student learning outcomes have increased after learning using Powtoon learning media.

Research conducted by Firdaus & Putra (2023) aims to develop Powtoon learning media in social studies subjects in class V. The results obtained are that the media developed can improve student learning outcomes (Aryanti et al., 2022; Lubis et al., 2023; Puspitarini et al., 2019; Toharudin, 2023). This can be seen from the results of the pretest and posttest student learning outcomes. When conducting a pretest on the learning outcomes of the small group, the overall average score of the students was 56, while in the large group it was 61. During the posttest on the learning outcomes of the small group, the overall average score of the students increased to 77, while for the large group it increased to 76. The increase in student learning outcomes based on pretest and posttest in the small group was 77.78%, while in the large group it was 72%. Thus, student learning outcomes have increased after learning using Powtoon learning media.

The aim of this research is to develop Powtoon learning media assisted by the PBL model in science and technology learning in fourth grade elementary school. It is hoped that the existence of this development product can help teachers carry out an effective, student-centred learning process so that goals can be achieved optimally.

Method

This research is research and development (R&D). The development model used is ADDIE, which has five stages, namely analyse, design, develop, implementation, and evaluation (Herawati et al., 2019).

The first is the analyse stage; at this stage, a needs analysis, curriculum analysis, student analysis, and facilities and infrastructure analysis are carried out. At the design stage, the material is prepared, the story script is created, and the image, sound, and video elements are collected, which are needed to design the

Powtoon media for the science and science learning that is being developed (Dewi et al., 2020; Putri & Susanti, 2022; Sadewi & Kamaludin, 2023). The second stage is to develop. At this stage, the product developed in accordance with the previous step is validated with experts, namely media experts, material experts, and language experts. Media that has been declared valid by the validator is then carried out in small group trials at SDN 169/III Mukai Mudik to see the practicality and effectiveness of the product on a limited scale. The third stage is implementation. At this stage, products that are valid and declared practical and effective are tested in small groups, then tested in large groups. Large group trials were carried out at SDN 77/III Mukai Tinggi and SDN 78/III Mukai Hilir. The aim of this stage is to see the practicality and effectiveness of the product on a wider scale. The final stage is evaluation. At this stage, it is carried out to assess the learning process and products before, during, and after learning.

In this research, the methods used to collect data were observation, interviews, questionnaires, and learning outcomes tests. Observation is used to see the conditions and facilities in the field. Interviews are used to dig up more in-depth information from actors in the field, namely teachers and students. The questionnaire is used to determine the suitability of the product, which is carried out by validators who are media, material, and language experts, as well as testing the practicality of the product. To analyse the results of the validation and practicality assessment, this was done by calculating the percentage. Then the quantitative data is interpreted into qualitative data by referring to the achievement level criteria. These achievements can be seen in Tables 1 and 2.

Table 1. Criteria for Achieving Validity

Score (%)	Category
81-100	Very Valid
61-80	Valid
41-60	Fairly Valid
21-40	Less Valid
0-20	Very Invalid

Table 2. Criteria for Achieving Practicality

Score (%)	Category
81-100	Very Practical
61-80	Practical
41-60	Quite Practical
21-40	Less Practical
0-20	Very Impractical

Meanwhile, learning outcomes tests are used to see the effectiveness of the learning media developed on student learning outcomes. The learning outcomes test consists of 25 multiple-choice questions. This is given before using the learning media and given again after the learning process has been carried out in three meetings using the media developed. The criteria for student learning outcomes can be seen in Table 3.

Table 3. Learning Outcome Level Criteria

Score (%)	Category
91-100	A (Very Good)
81-90	B (Good)
70-80	C (Fair)
<70	D (Less)

Result and Discussion

This development research produced a product in the form of Powtoon learning media assisted by PBL in science and science learning for fourth grade elementary school. The research was carried out using the ADDIE development model. The results of each development step include: First Analyze. In this step, a needs analysis is carried out by means of observation and interviews. The results of these activities are: lack of student enthusiasm in participating in the learning process (Sukmanasa et al., 2020; Udin & Rezania, 2024); during learning activities in class, it can be seen that student activity is still lacking. Students do not dare to ask the teacher about material they do not understand. Students look embarrassed and afraid to ask questions so that learning occurs predominantly in one direction, namely from the teacher only. Only a few students actively ask questions, opinions, or suggestions during class. The teacher explains that students' abilities are very diverse and their understanding of the material is very different. There are students who understand quickly, and there are those who take a long time to understand the material presented; and Science and technology learning does not yet use interesting and innovative digital media. The learning process predominantly uses textbooks only, then continues with students doing exercises.

In connection with the conditions that researchers encounter in the field, the needs analysis is: Students need encouragement from the learning environment so that they have high enthusiasm for learning; Students need to be active during the learning process; and Students and teachers need interesting and innovative learning media. Next, analyze the curriculum. The results of these analysis activities are that all three schools have used the independent curriculum. Meanwhile, the material that the researchers chose to organize into learning media is Chapter I IPAS material on plant body parts, photosynthesis, and plant reproduction. Then the results of the student analysis are that students are a generation that is close to renewable technology (Sunaryo et al., 2021). Therefore, developing learning media based on renewable technology, such as

powtoon media, is very appropriate. Then, the results of the analysis of facilities and infrastructure show that the three schools have good facilities. Starting with adequate classrooms, good projector equipment, and laptops in the school. Apart from that, the school is also equipped with wifi.

Second stage of design. At this stage, the Powtoon learning media is designed according to the results of the analysis in the first stage (Puspitarini et al., 2018; Sakti & Napsawati, 2021). This stage produces a prototype, which is then carried out a feasibility test at the next stage. Third is the development stage. At this stage, a validity test is carried out by material, media, and language experts. Based on the assessment that has been carried out. The following are the results of assessments from experts.

Table 4. Validator Assessment Results

Assessment Aspects	Evaluation %	Category
Material	81.33	Very Valid
Media	94.00	Very Valid
Language	78.95	Valid
Average	84.76	Very Valid

Based on Table 4, the score obtained from material experts is 81.33%, with a very valid category. The score obtained from media experts was 94%, with a very valid category. Meanwhile, the score from linguists was 78.95 in the valid category. However, before it can be tested. The media still needs to be revised according to advice from experts. The following are suggestions from experts and the results of revisions in accordance with expert advice.

Figure 1. Display of media Powtoon before and after revision: (a) Before revision the image in the background is not clear; (b) After revision The background image is clearly visible and added byinteresting animation; (c) Before revision no initial activity, namely conveying the learning objectives; and (d) After revision an initial activity has been added in the form of conveying learning objectives

After revisions have been made in accordance with expert advice, the media has been declared valid and can be tested (Elfiyah et al., 2023; Pertiwi et al., 2023; Purnama et al., 2022; Suprianti, 2020). The media is then tested on small groups. The results of trials in small groups on aspects of student practicality, teacher practicality, and effectiveness results in small groups can be seen in the Table 5.

Table 5. Product Practicality Results by Teachers in Small Groups

ser (Grade IV Teacher)	Percentage %	Category
ɔN 169/III Mukai Mudik	88.63	Very Practical

Table 6. Product Practicality Results by Students in Small Groups SDN 169/III Mukai Mudik

Number of students	Percentage %	Category
8	91.19	Very Practical

Table 7. Product Effectiveness Results in Small Groups SDN 169/III Mukai Mudik

Number of students	Pre-test average score	Predicate	Post-test average score	Predicate
8	50	D (Less)	83.5	B (Good)

Based on the results of the small group trial, in the practicality aspect, the teacher obtained a score of 88.63% in the very practical category. The student's gain from the practicality aspect was 91.19% in the very practical category. And in the results of the effectiveness test, the average pe-test score is 50 with the predicate D Less. Then, after learning is carried out using the developed media, At the post-test stage, the average score increased to 83.5 with the predicate B Good. Thus, learning media have been declared practical and effective on a limited scale. Next, the product is tested on a large group.

The fourth stage of implementation. At this stage, a large group trial was carried out. The results of the large group trial can be seen in the following table.

Table 8. Product Practicality Results by Teachers in Large Groups

User (Grade IV Teacher)	Percentage %	Category
SDN 77/III Mukai Tinggi	90.90	Very Practical
SDN 78/III Mukai Hilir	86.36	Very Practical
Average	88.63	Very Practical

Table 9. Product Practicality Results by Students in Large Groups

User (Grade IV Student)	Percentage %	Category
SDN 77/III Mukai Tinggi	92.80	Very Practical
SDN 78/III Mukai Hilir	93.18	Very Practical
Average	93.00	Very Practical

Table 10. Product Effectiveness Results in Large Groups

Number of students	The origin of the school	Pre-test average score	Predicate	Post-test average score	Predicate
18	SDN 77/III Mukai Tinggi	55.33	D (Less)	84.22	B (Good)
20	SDN 78/III Mukai Hilir	55.6	D (Less)	84.20	B (Good)
Average		55.47	D (Less)	84.21	B (Good)

Based on results from large group trials. The practicality assessment results by teachers and students, respectively, were 88.63% and 93%, both of which were in the very practical category. Meanwhile, for the effectiveness test, the average pretest score was 55.47 with the predicate D (poor). After learning using the media developed. The post-test results increased to 84.21 with the predicate B (good).

The fifth stage is evaluation. The result of this stage was that there were no obstacles found by teachers and students when using the media that the researchers developed. Thus, the product that the researchers developed was declared suitable for use in the science and science learning process in fourth grade elementary school.

Conclusion

This development research produced Powtoon learning media assisted by the PBL model in science and science learning in fourth grade elementary school. The overall assessment and analysis results stated that the Powtoon learning media assisted by the PBL model developed was suitable for use in the learning process. Powtoon learning media assisted by the PBL model developed can make students active in the learning process, so that students in the learning process play their role as they should, namely subjects in the learning process.

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Research Design and Concept, C.Y.W; and C.Y.W; field investigation and analysis, C. Y. W writing and drafting C.Y.W; H; Y.E; and D; editing, C.Y.W.

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Conflicts of Interest

The authors declare no conflict of interest.

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