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Interactive Multimedia Based on Project Based Learning Model Using Articulate Storyline 3 Material for Fifth-Grade Elementary School

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ABSTRAK

Penelitian pengembangan ini dilaksanakan karena kurangnya penggunaan media interaktif dalam proses pembelajaran yang mengakibatkan rendahnya hasil belajar siswa. Penelitian ini bertujuan mengembangkan Multimedia Interaktif berbasis model PjBL menggunakan aplikasi Articulate Storyline 3 pada Materi Siklus Air Kelas V SD yang layak, praktis dan efektif digunakan dalam meningkatkan hasil belajar siswa. Model penelitian yang digunakan adalah model penelitian ADDIE yang terdiri atas tahapan, yaitu: 1) analyze, 2) design, 3) development, 4) implementation, dan 5) evaluation. Subjek uji coba penelitian ini adalah siswa kelas V SD. Objek uji coba penelitian ini adalah hasil belajar siswa pada Materi Siklus Air Kelas V SD. Metode pengumpulan data yang digunakan adalah observasi kuantitatif dan tes. Instrumen yang digunakan untuk mengumpulkan data yaitu lembar rating scale dan tes pilihan ganda. Metode analisis data yang digunakan adalah analisis skor rata-rata untuk mengukur kelayakan dan kepraktisan serta rumus uji-t berkorelasi untuk mengukur efektivitas media terhadap hasil belajar. Hasil penelitian menunjukan bahwa: (1) rata-rata skor kelayakan media adalah 4,76 dan rata-rata skor uji materi adalah 4,63 dengan kualifikasi sangat tinggi, (2) rata-rata hasil uji kepraktisan oleh guru adalah 4,70 dan rata-rata uji kepraktisan oleh siswa adalah 4,97 dengan kualifikasi sangat baik, serta (3) nilai signifikansi (2-tailed) pada uji-t satu sampel memperoleh skor 0,000 sehingga Multimedia Interaktif berbasis model PjBL menggunakan aplikasi Articulate Storyline 3 efektif meningkatkan hasil belajar siswa pada materi Siklus Air kelas V SD. Sehingga dapat disimpulkan, implikasi penelitian ini, Multimedia Interaktif layak, praktis dan efektif dalam meningkatkan hasil belajar siswa materi Siklus Air kelas V SD.

ABSTRACT

This study addressed the need for more interactive media in the learning process, which has led to low student performance. The goal was to develop Project-Based Learning (PjBL) model-based Interactive Multimedia using Articulate Storyline 3 for Water Cycle material in Grade V Elementary School that is feasible, practical, and effective in enhancing student learning outcomes. The research followed the ADDIE model: 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation. Subjects were Grade V students, and the focus was on their learning outcomes for the Water Cycle material. Data collection involved quantitative observation and tests using rating scale sheets and multiple-choice tests. Data analysis included average score analysis for feasibility and practicality and a correlated t-test for effectiveness. Results indicated that: (1) the average feasibility score of the media was 4.76, and the material test score was 4.63, both rated very high; (2) the average practicality test score was 4.70 by teachers and 4.97 by students, both rated very good; and (3) the significance value in the one-sample t-test was 0.000, showing the PjBL model-based Interactive Multimedia with Articulate Storyline 3 effectively improved student learning outcomes for the Water Cycle material in Grade V. Thus, the research concludes that Interactive Multimedia is feasible, practical, and effective in enhancing student learning outcomes for the Water Cycle material in Grade V Elementary School.

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1. INTRODUCTION

Education is an important element for the advancement of a nation's civilization. In organizing education, learning is the most important thing to pay attention to. Learning is the interaction of students with teachers as educators in the learning process to achieve learning goals (Dewi, 2019; Warif et al., 2019). Schools, as formal educational institutions, have the task of carrying out their roles to realize the educational goals that have been formulated optimally; one way is by implementing Science and Technology (IPTEK) (Ariyanti, 2019; Winiharti et al., 2022). Technology can improve quality and reach if used wisely for education and training, and it has a very important meaning for welfare. One of the learning contents that must be integrated with the use of technology is Natural Sciences (IPA). Natural Science is the knowledge that studies all events related to the universe. The essence of Natural Science (IPA) is a collection of natural sciences that interact with technology and are applied in everyday life in schools and society (Firdaus & Wilujeng, 2018; Lailiyah & Istianah, 2020). One of the materials in Natural Science (IPA) learning in the fifth grade of elementary school is the Water Cycle. Science learning enormously benefits human life because students can improve their knowledge, skills, and attitudes in responding to natural phenomena in their environment by studying science. In implementing education, of course, an ideal condition is expected. The ideal condition in science learning is to create an interesting, innovative, creative, and interactive learning process. This ideal learning certainly involves the use of learning tools in the process. Learning tools can help teachers in conveying learning content.

However, in reality, problems are found in the field, such as (1) the use of learning media that is still limited to the material, especially in science material, (2) science learning that is implemented has not shown independent, meaningful and interesting activities, (3) lack of student activity and participation in the science learning process which has an impact on learning outcomes, (4) lack of understanding of science subjects caused by lack of media use and monotonous learning, (5) in the learning process, learning models have been used but only limited to conventional learning models, (6) there has been no development of Interactive Multimedia on the Water Cycle material. The problems above impact low student learning outcomes in the science subject of the Water Cycle material.

The learning media and learning models teachers use in teaching should be updated to solve these problems. As an alternative to overcome these problems, researchers implemented Interactive Multimedia based on the PjBL model using the Articulate Storyline 3 application to optimize student learning outcomes in the Water Cycle material for fifth-grade elementary school. Each learning media has advantages, including Interactive Multimedia. The advantages of Interactive Multimedia are: (1) It has an interactive nature, which can accommodate user reactions. In addition, the word interactive also has the meaning that users and multimedia require interaction to use it in the learning process; (2) independent, meaning that Interactive Multimedia makes it easy for users without guidance from others; (3) complete, meaning that Interactive Multimedia provides complete content in it to support the learning process (Pratiwi et al., 2018; Salsidu et al., 2018).

Based on the advantages explained above, apply Interactive Multimedia in Natural Science (IPA) learning to determine the effectiveness of student learning outcomes in the Water Cycle material. Therefore, a supporting learning model is needed to attract students' attention and interest in applying this interactive multimedia. One model that is suitable for application with Interactive Multimedia is the Project Learning (PjBL) model the Project Based Learning (PjBL) model is an innovative learning model that is centered on students' emphasizing projects and makes teachers facilitators in learning (Habib et al., 2020; Ratnasari et al., 2018). Each learning model has advantages, including one project-based Learning (PjBL) model. The advantages of the Project Based Learning (PjBL) The advantages of the project-based learning model include: (1) the PjBL model is integrated with the curriculum so that it does not require any additional elements in its implementation, (2) students are directly involved in the learning process, (3) students are emphasized to always work together in solving problems, (4) technology is integrated as a tool for discovery, collaboration and communication in achieving learning, (5) improving teacher skills in implementing project-related learning.

Previous research findings stated that Interactive Multimedia based on the PjBL model can be used as an alternative because it is useful for students and teachers to support the science learning process and can influence science learning outcomes compared to printed books (Habib et al., 2020; Sadikin et al., 2020). The next finding also stated that learning with the PjBL model based on interactive multimedia positively affects student learning outcomes (Ana Dwi et al., 2023; Yuniasih et al., 2022). In addition, other findings that are in line state that interactive multimedia learning media based on PjBL is suitable for use as a learning medium (Meilina et al., 2024; Pratama et al., 2022). Based on the results of several relevant studies, interactive multimedia is feasible, practical, and effective for use in the learning process. However, previous research findings have not yet discussed Interactive Multimedia based on the PjBL Model using the Articulate Storyline 3 application on the Water Cycle material. Thus, this distinguishes this study from

previous studies. Then, Interactive Multimedia was developed, which will be applied in the science content of the Water Cycle material for fifth-grade elementary school. This study aims to create Interactive Multimedia based on the PjBL Model using the Articulate Storyline 3 application on the Water Cycle material that is feasible, practical, and effective in improving student learning outcomes. By developing this media, it is expected to provide a positive contribution to providing learning media for students.

2. METHOD

This study uses the Research and Development (R&D) method. The Research and Development (R&D) method is a study that develops a new product or improves an existing product that can be accounted for (Darojat et al., 2022; Muthohir, 2019). The research model used in this study is the ADDIE research model. The ADDIE research model consists of 5 stages: analysis, design, development, implementation, and evaluation (Dwi Yasa et al., 2020; Rustandi, 2021).

The analysis stage includes an analysis of the curriculum in force in the target school, student needs, and student characteristics. The design stage is carried out with the first activity, namely designing the form of multimedia to be created. At the development stage, the completed design is developed to produce Interactive Multimedia based on the PjBL model using the Articulate Storyline 3 application on the Water Cycle material for fifth-grade Elementary School. The developed media was consulted with the supervising lecturer to obtain input and suggestions for improvement. After the media was improved, an expert test was conducted to assess the feasibility of the media. The expert test consisted of the Interactive Multimedia feasibility test and the Interactive Multimedia learning content feasibility test. The data obtained from the media test results were then analyzed to determine the feasibility of Interactive Multimedia based on the PjBL model using the Articulate Storyline 3 application on the Water Cycle material for fifth grade of elementary school that had been developed, then improved if there were suggestions and input. After the Interactive Multimedia feasibility test was conducted, the teacher continued the interactive multimedia practicality test and the students' interactive multimedia practicality test. The implementation stage was carried out after the media was declared feasible and practical for learning. At this stage, interactive multimedia will be implemented in the target schools for development to determine the effectiveness of the media on learning outcomes in the Water Cycle material for grade five elementary school students.

In research, of course, it cannot be separated from the subject to be studied, such as this development research on the development of Interactive Multimedia based on the PjBL model Using the Articulate Storyline 3 Application on the Water Cycle material for fifth-grade elementary school. The subjects to be studied are termed population and sample. In a study, population and sample have an interrelated relationship. Population is the entire group of people (or institutions, events, or other objects of study) to be described and understood (Firmansyah & Dede, 2022; Monica et al., 2023). The population for this study was elementary school movers throughout Buleleng Regency, Bali. Sampling was used to collect data. Sampling is a population selection process that will be used to obtain samples (trial objects) that describe the population. Purposive sampling is a sample determination technique with certain considerations (Firmansyah & Dede, 2022). The trial was conducted with only one class using the One Shot Case Study design. This trial only involved one group (X) in a certain treatment, which was then continued with observation or measurement (O). In the product trial stage, the dependent variable measured is the learning outcomes of fifth-grade students, which begins with implementing learning with the help of Interactive Multimedia based on PjBL. Students are given an evaluation sheet to determine the value or learning outcomes of students compared to the applicable learning objective achievement criteria (KKTKP). At the evaluation stage, formative evaluation and summative evaluation are carried out. Formative evaluation is carried out during the development or at each stage, namely the design, development, and implementation stages. In contrast, summative evaluation is carried out at the end of the research activity.

This study uses quantitative observation methods and test methods. The observation method is one of the data collection methods carried out by conducting direct systematic observations of the objects being studied. In contrast, the test method is a way to determine students' knowledge, intelligence skills, and abilities by using several questions in the form of objective tests (Chairanie, 2020; Nasution, 2016). This study uses quantitative observation to obtain data related to the feasibility and practicality of the media. The instrument used to conduct quantitative observations is a rating scale sheet with a scale of 1-5. The test method is used to test the effectiveness of Interactive Multimedia on the learning outcomes of Science on the Water Cycle material for fifth-grade elementary school. The instrument used is a multiple-choice test of 15 items. The instrument grid for experts on the feasibility of Interactive Multimedia, the practicality of Interactive Multimedia, and the learning outcome grid instrument are presented in Table 1, Table 2, Table 3, Table 4, and Table 5.

Table 1. Interactive Multimedia Feasibility Instruments

No	Aspect	Indicator	Total Item
1.	Content Quality	a) Clarity of presentation of material. b) Suitability of material with learning objectives. c) Depth and breadth of material. d) Suitability of images with material. e) Suitability of animation with the material. f) Suitability of video with material g) Suitability of project with material.	7
2.	Language Quality	a) Clarity of meaning of words. b) Accuracy of language use by EYD rules.	2
3.	Quality of Practice/Test Questions	a) Suitability of the type of exercise/test with the learning objectives. b) Balance of the proportion of questions with the material.	2
		Jumlah	**11**

Table 2. Learning Content Feasibility Instrument

No	Component	Indicator	Total Item
1.	Text	a) Suitability of text type and size. b) Clarity of text on each topic of discussion. c) Suitability of text color with background.	3
2.	Image	a) Clarity of images in Interactive Multimedia. b) Interesting images. c) Images support the explanation of the material. d) Appropriateness of image placement.	4
3.	Animation	a) Animation quality. b) Suitability of the animation used.	2
4.	Video	a) Video quality. b) Clarity of sound in the video. c) Appropriateness of the video to the learning material. d) Video supports and facilitates understanding of the material presented. e) The attractiveness of the video used.	5
5.	Audio	a) Suitability of music and sound effects.	1
6.	Layout	a) Appropriateness of text placement. b) Appropriateness of media size. c) Appropriateness of menu composition.	3
7.	Program Operation	a) Ease of use of Interactive Multimedia. b) Interactive Multimedia can be used repeatedly.	2
		Total	**20**

Table 3. Practical Instruments by Teachers

No	Component	Indicator	Total Item
1.	Aspects of Learning Media Display	a) Overall, the appearance of Interactive Multimedia is attractive. b) The writing in Interactive Multimedia can be read clearly. c) The images in Interactive Multimedia are visible. d) The harmony of sound with the backsound in the learning material video. e) The color display of Interactive Multimedia is attractive.	5
2	Content Quality Aspects	a) The material contained in Interactive Multimedia can be explained easily to students so that it can be understood. b) The questions presented in Interactive Multimedia are by the material. c) Interactive Multimedia already contains problems that are caused by the surrounding environment.	3

No	Component	Indicator	Total Item
3.	Operational Aspects of Interactive Multimedia	a) Interactive Multimedia can be used easily for teaching. b) Interactive multimedia can be used repeatedly, thus improving the effectiveness of learning.	2
		Total	10

Table 4. Practical Instruments by Students

No	Component	Indicator	Total Item
1.	Material Aspect	a) Clarity of the material presented. b) Suitability of the language used in delivering the material. c) Ease of the material.	3
2.	Multimedia Quality Aspects	a) Clarity of learning instructions. b) Attractiveness of multimedia display. c) Attractiveness of colors and images in Interactive Multimedia. d) Ease of use of Interactive Multimedia.	4
3.	Aspect of Usefulness	a) The usefulness of media in helping students understand the material/topic. b) The enthusiasm of students to learn with learning media. c) The attractiveness of media to attract students' interest in learning.	3
		Total	10

Table 5. Learning Outcome Instrument

No	Learning Materials	Question Indicator	Cognitive Level	Question Form	Question Number
1	Water Cycle	Students can identify the concept of the Water Cycle.	C3	PG	1
		Students can identify the concept of the stages of the Water Cycle with other stages.	C3	PG	2,3,4
		Students determine the stages in the Water Cycle.	C3	PG	5
		Students examine the stages of the Water Cycle through a picture.	C5	PG	6,7,8
		Students show examples of the use of water in everyday life.	C2	PG	9,10
		Students show examples of actions that disrupt the Water Cycle.	C2	PG	11,12,13
		Students mention examples of water conservation activities.	C4	PG	14
		Students show natural disasters due to disruption of the Water Cycle.	C2	PG	15, 16
		Students examine the reasons for the reduced availability of clean water.	C5	PG	17
		Students determine efforts to overcome the lack of clean water supplies.	C3	PG	18
		Students analyze the role of water in the lives of living things.	C4	PG	19,20

The jury tested the instrument created to determine the validity of the content and reliability of the instrument. The content validity test in this study used the Gregory formula. The results of the content validity test of the expert assessment instrument for the feasibility of Interactive Multimedia, the feasibility of the Interactive Multimedia learning content, the practicality of Interactive Multimedia by teachers, and the practicality of Interactive Multimedia by students were 1.00 with a very good content validity category.

Item validity used the point biserial technique (γ_{pbi}), getting results from 20 test questions, 17 of which were valid and three invalids. The reliability of the instrument used the Kunder Richardson 20 formula (KR-20), and the results of the test reliability criteria were very high. The difficulty level was tested using the formula $P = \frac{nB}{n}$, and the results of 20 questions were 1 question in the easy category, 18 questions in the moderate category, and 1 in the difficult category. The discriminatory power uses the formula $B = \frac{nBA}{nA} - \frac{nBB}{nB}$, and the results show that nine questions have very good discriminatory power, seven have good discriminatory power, and three have poor discriminatory power.

This study's methods and data analysis techniques are descriptive summat and quantitative. Qualitative analysis processes input data and suggestions from experts, teachers, and students regarding creating interactive multimedia. The review results are then used to refine the media and products created. Meanwhile, the quantitative descriptive analysis method is used to process data in the form of Interactive Multimedia feasibility scores from each expert, Interactive Multimedia practicality scores from teachers and students, and Interactive Multimedia's effectiveness. The results of the Interactive Multimedia feasibility scores and the practicality of Interactive Multimedia are calculated using the average formula. The average score is then converted into a five-scale conversion guideline to classify the feasibility and practicality of the media developed. The five-scale conversion guideline is presented in Table 6.

Table 6. Five-point Scale Conversion Guidelines

Score Interval	Classification Predicate
$3.75 \leq \bar{X} < 5.01$	Very Good
$2.92 \leq \bar{X} < 3.75$	Good
$2.08 \leq \bar{X} < 2.92$	Enough
$1.25 \leq \bar{X} < 2.08$	Not Good
$0 \leq \bar{X} < 1.25$	Bad

(Eri Karisma et al., 2020)

The effectiveness test measures the success of media use in improving student learning outcomes. The effectiveness of interactive multimedia on student learning outcomes is analyzed using the correlated t-test formula. Before conducting the t-test, a prerequisite test is first carried out, namely the data normality test using the Shapiro-Wilk method because the sample data is less than 50.

3. RESULT AND DISCUSSION

Result

The results discussed in this study consist of 4 main points, namely (1) Interactive Multimedia design, (2) Interactive Multimedia feasibility, (3) Interactive Multimedia practicality, and (4) Interactive Multimedia effectiveness. The development of Interactive Multimedia based on the PjBL Model using the Articulate Storyline 3 application on the Water Cycle Material was carried out by referring to the ADDIE model, which includes the analysis, design, development, implementation, and evaluation stages.

The first stage is the analysis stage. At this stage, the activities carried out are needs analysis, which consists of curriculum analysis, needs analysis, and characteristic analysis. Based on the curriculum analysis, it was found that the applicable curriculum was the independent curriculum. Curriculum analysis was carried out by examining the flow of learning objectives (ATP), Learning Achievements (CP), and learning objective completion criteria (KKTP). Furthermore, needs analysis was carried out using interviews, and it was found that student learning outcomes tended to vary, where out of 34 students, around 60% had low scores. Hence, teachers and students needed solutions to improve learning outcomes.

Furthermore, characteristic analysis was carried out by giving questionnaires to students. The results of the characteristic analysis show that out of 34 students, 82.35% find it difficult to understand science material if the learning process is carried out without using media, out of 34 students, 88.23% of students are more interested in learning utilizing technology, out of 34 students, 5.90% prefer auditory learning styles, 20.59% prefer visual learning styles, 14.71 prefer auditory learning styles and 50% prefer kinesthetic learning styles, out of 34 students, 2.94% prefer audio-based learning media, 14.71 prefer visual-based learning media and 79.41% prefer audio-visual learning media, 5. Out of 34 students, 85.29% are more interested if involved in a practical activity or project in the science material learning process, compared to just learning the theory, 6. Out of 34 students, 64.70% stated it took more work to understand science learning material based on the teacher's explanation. For most students, science learning material still needs to be more abstract. Media assistance is needed to explain the contents of the material. In contrast, 20.59% stated they were in the middle of understanding the science material, and 17.65% stated

that it was easy to understand the material based on the teacher's explanation. All students were interested in developing Interactive Multimedia based on the PjBL model.

The second stage is design. At this stage, the development of Interactive Multimedia based on the PjBL model is to design. The activities carried out at this stage are determining the software used to create Interactive Multimedia based on the PjBL model, creating a design, creating an instrument for the feasibility of Interactive Multimedia, the practicality of Interactive Multimedia, and a grid of questions on the effectiveness of Interactive Multimedia on learning outcomes.

The third stage is development. At this stage, the development of Interactive Multimedia based on the PjBL model is carried out using the design that was made previously. The development stage consists of product development, feasibility testing, practicality testing, and revision. The activities of several media creation activities are presented in Figure 1 and Figure 2.

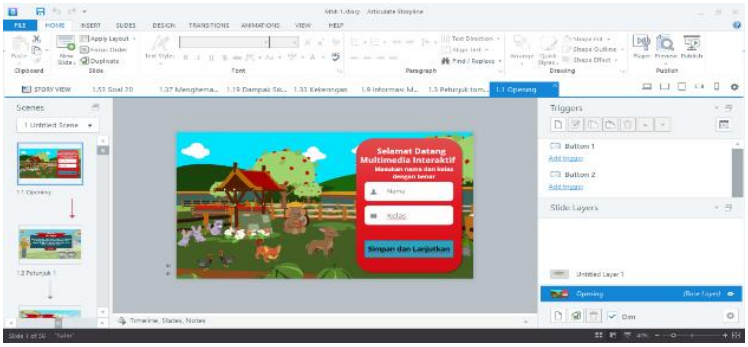

Figure 1. Process of Creating an Interactive Multimedia Opening Display Based on the Pjbl Model

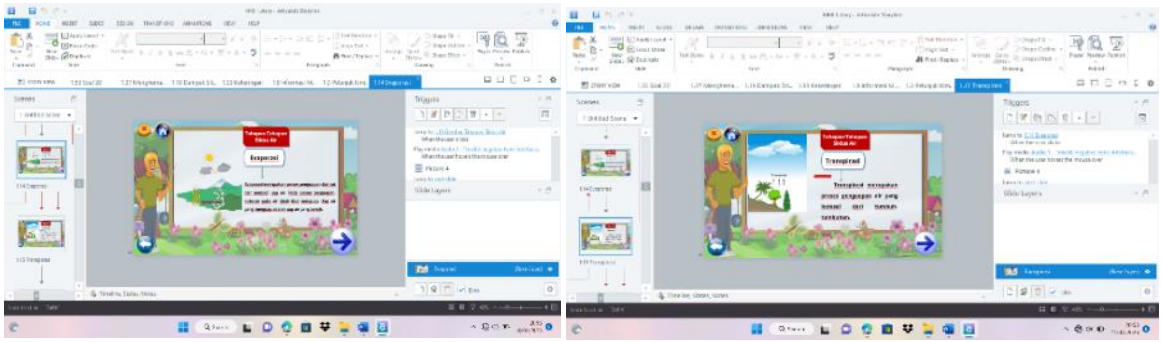

Figure 2. Filling in the Material

The expert test was conducted by providing assessment sheets to experts: four lecturers, two media feasibility experts and two learning content feasibility experts, three teachers as practitioners, and six fifth-grade students as practitioners. The assessment of media feasibility experts and practitioners used a rating scale. The media feasibility and media practicality test results can be seen in Table 7 and Table 8.

Table 7. Feasibility Test Results

No	Expert	Eligibility Results	Qualification
1	Media expert test	4.76	Very Good
2	Learning content expert test	4.63	Very Good

Table 8. Practicality Test Results

No	Expert	Eligibility Results	Qualification
1	Teacher practitioner test	4.70	Very Good
2	Student practitioner test	4.97	Very Good

The fourth stage is implementation. The implementation stage is carried out after Interactive Multimedia is declared valid and practical for learning. At this stage, Interactive Multimedia is implemented in target schools to determine the effectiveness of Interactive Multimedia on learning outcomes in the Water Cycle material for fifth-grade elementary schools. The trial was conducted with only 1 class using the One

Shot Case Study design. In the product trial stage, the dependent variable measured is the learning outcomes of fifth-grade students, which begins with implementing learning with the help of Interactive Multimedia based on PjBL. Students are given an evaluation sheet to determine the value or learning outcomes of students, which are compared with the applicable learning objective achievement criteria (KTKP). The data analysis method used in the implementation stage is the correlation t-test assisted by SPSS IBM 25. At the implementation stage, the results showed that Interactive Multimedia effectively improves student learning outcomes.

The fifth stage is evaluation. The evaluation carried out during this research is in the form of formative and summative evaluation. Formative evaluation is carried out during the development or at each stage, namely the design, development, and implementation stages. Meanwhile, summative evaluation is carried out at the end of the research activity. Summative evaluation is the end of all stages to reflect the research process and ensure the resulting product is high quality. At the development stage, experts assess the research instrument, and media and content experts and a practicality test by teachers and students perform a feasibility test. Two judges assess the research instrument. The evaluation given by the expert lecturer on the instrument is (1) improving punctuation in the questions and (2) suggestions for adjusting the questions to the question grid. Media and learning content experts also conduct a feasibility test at the development stage. The evaluation given by the media expert is (1) improving the writing, (2) adjusting the contrast between the background and the text, (3) making project implementation instructions, and (4) replacing the instructions on the evaluation menu using numbering. The learning content expert conducts a learning content test at the development stage. The evaluation given by the learning content expert was that (1) the writing could have been neater, especially in the questions, namely, the answers started from lowercase letters except for the name and place, and (2) the learning objectives could have been added. The practicality test was carried out at the target elementary school by taking three teacher practitioners and six student practitioners. The input and suggestions from the practitioners were (1) making media so students could access it offline.

The evaluation at the development stage aimed to produce valid research instruments and products that were feasible and practical to use. At the implementation stage, the effectiveness test of Interactive Multimedia was carried out on the learning outcomes of fifth-grade science on the Water Cycle material. The media implementation was carried out at the target school for the study. The evaluation results showed that the Interactive Multimedia that was developed effectively improved the learning outcomes of fifth-grade science on the Water Cycle material. If a summative evaluation is carried out, all stages in the research model have been carried out well. This is because all problem formulations have been answered, and the research objectives have been achieved. Due to the constraints or problems of time, energy, and funds in product development, due to these limitations, the research was only carried out until the pre-experimental implementation.

Discussion

This development research produced Interactive Multimedia related to fifth-grade students' Water Cycle material. This research was carried out through the ADDIE development model's five stages: analysis, design, development, implementation, and evaluation (Dwi Yasa et al., 2020; Rustandi, 2021). This multimedia is good for learning because it has undergone feasibility, practicality, and effectiveness tests. This Interactive Multimedia has its characteristics compared to other Interactive Multimedia because it is based on the PjBL learning model with Water Cycle material. The topic of the material is adjusted to the syntax of the PjBL model. It contains a project menu with instructions and videos of problems related to the water cycle, which are used as benchmarks for making products. The detailed reasons why Interactive Multimedia is feasible, practical, and effective.

First, the learning content aspect, the learning content of Interactive Multimedia based on the PjBL model that was developed showed very good qualifications. This is because the multimedia developed has a scope of material based on the learning achievements, learning stages, and learning objectives to be achieved. The content aspect of multimedia learning content can be seen from the suitability of the presentation of learning content with the formulation of learning objectives. Students can easily learn the material presented (Audhiha et al., 2022; Yuliana et al., 2022). Interactive multimedia must pay attention to the suitability of its components to produce quality media based on its use and purpose. The good quality of media is obtained from presenting content or material to the demands of learning objectives (Kristanti & Sujana, 2022). Based on this, the learning content aspect in developing media becomes very important in influencing media quality.

Both aspects of design, the media design developed, show very good qualifications. This is because the media developed has considered the suitability of the media with learning objectives. Quality learning media that is feasible to apply needs to pay attention to the clarity of the material, images, questions, and

evaluations (Miftah & Nur Rokhman, 2022; Milala et al., 2022). The learning content in the media must be adjusted to analyze student characteristics to make the learning process more effective (Diah Purnami Dewi & Wayan Suniasih, 2022; Riskiani & Wulandari, 2022). Based on this, in making learning media, attention must be paid to the suitability of learning objectives with media design to create quality media.

Third, the Interactive Multimedia developed shows very good qualifications. This is because the Interactive Multimedia developed has a display that suits the characteristics of students and the clarity of the presentation of learning materials. The appearance of the media must also be considered according to the characteristics of students who like colorful and illustrated things. Elementary school children like and choose bright colors for images and animations because bright colors tend to seem cheerful and stimulate children's attention (Chaedoni & Saputra, 2022; Habib et al., 2020). In addition, animations in the form of cartoons are also used to support the appearance of Interactive Multimedia. The selection of cartoons can attract students' interest because cartoon objects tend to have bright images with various shapes (Handadi, 2020; Maghfiroh & Suryana, 2021). Based on this, media qualifications are influenced by the attractive appearance of the media in terms of images and animations.

In addition, based on the practicality test of students and teachers on the media developed, the product assessment was very good. This can be seen from the enthusiasm of students for using the interactive multimedia developed. The learning media developed attracts students' attention and focus in its use; the Interactive Multimedia can attract students' interest in learning because it contains interesting features, images, colors, and animations. Students feel enthusiastic when learning using Interactive Multimedia because of the suitability of the learning content, learning steps, and objectives (Anggraeni et al., 2021; Supardi, 2014). To attract the attention of students, the media used must be of good quality in terms of feasibility and practicality so that it can make it easier for students to implement learning to achieve the desired learning outcomes (Harsiwi & Arini, 2020; Shaleh & Fadhilah, 2022). Based on this, interesting media can increase students' interest and motivation in learning.

This study found that Interactive Multimedia based on the developed PjBL model is suitable for use as a learning medium. This is because multimedia based on the PjBL model has advantages over other media. The advantages of interactive multimedia are that it combines text, images, audio, animation, and video in one unit that supports each other in the learning process. Increase learning motivation during the teaching and learning until the desired learning objectives are obtained. The learning process becomes more interactive. Able to visualize material that has been difficult to explain only with explanations or conventional teaching aids. The media is packaged based on the PjBL model, which can improve student learning outcomes. Thus, interactive multimedia based on PjBL can be easily used by teachers to provide lessons, especially the Water Cycle material for science learning content. Using Interactive Multimedia in the learning process can create a comfortable and interesting learning atmosphere, so Interactive Multimedia effectively improves student learning outcomes (Nurhadiyati et al., 2020; Pratiwi et al., 2018). Using interactive multimedia based on the PjBL model in science learning on the Water Cycle material can create an active, effective, and interesting learning atmosphere that can improve student learning outcomes.

This finding is reinforced by previous research findings, which state that Interactive Multimedia effectively increases students' interest in learning (Aulia & Masniladevi, 2021; Nahdhiah et al., 2021). Other research findings also state that the application of interactive multimedia in the learning process is very effective and can improve student learning outcomes (Rahmadhani et al., 2022; Rihani et al., 2022). The next finding also states that learning with the PjBL model based on interactive multimedia positively affects student learning outcomes (Ana Dwi et al., 2023; Yuniasih et al., 2022). In addition, other findings that are in line state that interactive multimedia learning media based on PjBL is suitable for use as a learning medium (Meilina et al., 2024; Pratama et al., 2022). The development of Interactive Multimedia based on the PjBL model using the Articulate Storyline 3 application on the Water Cycle material for fifth-grade elementary school has never been developed before, so this research on the development of Interactive Multimedia based on the PjBL model is a novelty in research related to interactive multimedia. In addition, the results of relevant research and research conducted show that interactive multimedia based on the PjBL model is feasible, practical, and effective for use in the learning process. Thus, interactive multimedia based on the PjBL model can positively impact students' learning process.

The contribution of this research is that teachers can use interactive multimedia based on the PjBL model produced in this development research to implement learning and positively affect students' understanding of the learning material. The implementation of this research has limitations, namely that this media only contains Water Cycle material, so the author recommends that further researchers develop media with more varied variables or material coverage. This research implies that this interactive multimedia is designed based on the PjBL model so that students can be active in learning activities and can motivate teachers to improve student learning outcomes.

4. CONCLUSION

Based on the feasibility, practicality, and effectiveness analysis, it was obtained that Interactive Multimedia based on the PjBL model developed is feasible, practical, and effective for learning. Interactive Multimedia based on the PjBL model can attract students' attention and interest in learning. It is recommended that students study seriously and that teachers use various learning media.

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