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Development of IPA Educational Material Based on Infographic Media on Water Cycle Material Grade 5 Elementary School Students

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Abstract

This research aims to develop science teaching materials based on infographics on the water cycle for fifth-grade students. This process involves observations and Design and Development (D&D) methods, adapted from the ADDIE model. Seventy fifth-grade students at Cimuncang Elementary School participated in the experiment. In trials with fifth-grade students at CIMUNCANG Elementary School, learning media achieved a quality score of 94.73%, falling into the good category. These results highlight the successful creation of effective infographic-based teaching materials for the water cycle, confirmed by positive expert assessments and high-quality implementation in student trials.

Keywords: Learning Media, Education, Education Quality

Pengembangan Bahan Ajar IPA Berbasis Media Infografis Pada Materi Siklus Air Kelas 5 Sekolah Dasar

Abstrak

Penelitian ini bertujuan untuk mengembangkan bahan pengajaran sains berdasarkan infografis pada siklus air untuk siswa kelas lima. Proses ini melibatkan pengamatan dan metode Desain dan Pengembangan (D&D), disesuaikan dari model ADDIE. Tujuh puluh siswa kelas lima di Sekolah Dasar Cimuncang berpartisipasi dalam percobaan. Dalam uji coba dengan siswa kelas kelima di SD CIMUNCANG, media pembelajaran mencapai skor kualitas 94,73%, jatuh ke dalam kategori baik. Hasil ini menyoroti keberhasilan penciptaan bahan pengajaran berbasis infografis yang efektif untuk siklus air, dikonfirmasi oleh penilaian ahli yang positif dan implementasi berkualitas tinggi dalam uji coba siswa.

Kata kunci: Media pembelajaran; Pendidikan; Kualitas Pendidikan

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INTRODUCTION

One of the pivotal elements in human life is education, playing a crucial role in shaping both society and individuals. Ideal learning significantly impacts student development, involving cognitive, affective, and psychomotor potential development, along with knowledge, values, and character transfer (Suardi, 2018). In the contemporary era, education faces rapid changes in science and technology, leading to increasingly complex challenges in various aspects of life. Therefore, education must prepare students to think futuristically, critically, and creatively, aiding them in overcoming contemporary challenges (Luthfiani et al., 2022). According to (Safira et al., 2020), Indonesia grapples with macro and micro-level issues, including uneven education implementation and micro-level challenges like curriculum concerns.

Curriculum is a crucial problem in education, and one of its components is teaching materials. In the realm of Natural Science (IPA) instruction, materials such as the water cycle are taught to raise awareness of nature and cultivate environmental concern (Mahendrawan et al., 2016). Directly studying the water cycle in nature may not always be feasible; hence, effective learning media are required (Fetra & Risda, 2020). In the context of IPA learning, data visualization, also known as infographics, emerges as an attractive and effective option (Taufik et al., 2018). Previous studies indicate that infographics can enhance students' interest in learning (Tumewu et al., 2023) The researchers aim to create infographic-based teaching materials on the Water Cycle topic for fifth-grade students at SDN Cimuncang. This underscores the importance of producing high-quality teaching materials.

The primary objective of this research is to address educational issues in Indonesia and enhance students' interest and learning quality. Aiding IPA learning in Indonesia through infographic media is the main goal of this research. In the context of Indonesian education, the lack of effective and engaging educational materials is a primary concern. Despite rapid developments in education and technology, issues persist in delivering educational content, particularly in the curriculum, to provide students with a better learning experience. This research focuses on the deficiency of captivating and comprehensive learning materials to teach the water cycle topic to fifth-grade students at SDN Cimuncang. The complexity of the subject matter, the need to raise environmental awareness, and the limitations in directly observing natural phenomena all contribute to the emergence of this problem.

Thus, the primary aim of this research is to solve this issue, contributing to the improvement of the education system in Indonesia by developing media-based solutions that enhance student engagement and learning quality. The literature review in this study encompasses a comprehensive examination of education, curriculum development, and the utilization of media in the teaching and learning process. It establishes the theoretical foundation of the research and emphasizes the necessity of effective education, interactive learning, and the incorporation of technology in teaching. The literature review also evaluates the pros and cons of various learning tools, underscoring the importance of seeking new methods to address the challenges students face when studying complex subjects like the water cycle. This confirms the relevance of the research in developing infographic-based educational materials to enhance students' understanding of the water cycle concept in the context. The focus of this research is to create infographic-based teaching materials for elementary school students on the water cycle topic. In this study, infographics are utilized as a learning tool that has not been extensively explored in primary education. A notable research gap identified is the lack of studies combining infographics with water cycle content in primary schools. Additionally, there has been no specific research examining how the use of infographics affects students' understanding of the water cycle. Therefore, the main objectives and outcomes of this research are to develop new teaching materials based on infographics and measure how these materials impact

fifth-grade students' understanding of the water cycle. This research is expected to provide a fresh perspective on elementary education and promote the use of infographics as an effective learning tool in schools in Indonesia.

METHODS

The design and development (D&D) approach, often known as designing and developing, is applied in this study. Design and development studies are an in-depth examination of the design, development, and assessment processes to develop an empirical foundation for the creation of new or updated goods, instructional materials, and models that govern their development. Research and development are methods used in education to create and validate academic outputs. (Richey, 2007) The goal of this project is to create the design and practicality of the IPA teaching material on the Water Cycle using the ADDIE development paradigm. Analysis (problem analysis), design (product proposal), development (development), implementation (implementation), and evaluation are the phases of the ADDie paradigm. This survey includes materialists, media specialists, and respondents.

According to (Sugiyono, 2015), data was collected by asking respondents to answer a series of written questions. To evaluate the material created, Angket is utilized to collect data from media experts, material experts, and respondents in this study. In this lift, data on learning media development is collected using the Likert scale. There were two types of data collected: quantitative (IPA Media Based Infographic Assessment on Water Cycle Materials of Grade 5 Elementary Schools) and qualitative (input and advice from media and material specialists). This research data was gathered from two material specialists and two media experts. A total of 70 students were used in the study; media assessment lifts were used for students, media experts, and material specialists. Students from the V class of the Basic School of Research Places (SDN Cimuncang) were surveyed to collect data. The data is then analyzed to generate descriptive data. Following the validation of the water cycle infographics by media and material experts, the information is assessed utilizing percentage descriptive approaches employing the following formula (Sudijono, 2006) :

$$P = \frac{f}{N} x\ 100\%$$

Description:
F = Percentage of frequency being searched.
N = Number of Cases

Processing of transport data using the Likert Scale, the following are the scores used (Purwanto, 2013)

Table 1. Percentage range and material eligibility criteria

Presentation Range	Criteria
86% - 100%	Very Good
76% - 85%	Good
60% - 75%	Enough
55% - 59%	Not Good

FINDINGS AND DISCUSSION

Results of evaluation or validation by material experts and media experts, as well as implementation or testing on students, are presented in Table 2 below :

Table 2. Material Expert, Material Expert, & Implementation Validation Results

Validation and Implementation Results	Percentage
Material Expert Validation	80.95 %
Media Expert Validation	77.94 %
Implementation of the student V sd class	94.73 %

The results of the material validation obtained a percentage score of 80,95% with a good category, then the results of validation by a media expert obtained a percentual score of 77.94% with the good category. Implementation on the students in class V obtains a learning media quality result of 94.73% with a very good Category. So that the teaching material is used in the use of IPA Learning Media Based Infographic Media on Water Cycle Materials Grade 5 Basic School. Further, the results of media evaluation by material experts and media experts on each aspect can be seen in Table 2 and Table 3 below.

Table 3. Media Validity Assessment by Material Experts

Aspect	Percentage	Category
Materials	77. 38 %	Good
Learning	86. 66 %	Very Good
Evaluation	79.16 %	Good

The results of the quality assessment of the learning media by the material expert are as follows: the material aspect received a score of 77.38% with a good category, the learning aspect received a score of 86.66% with an excellent category, and the evaluation aspect received 79.16% with the excellent category.

Table 4. Media Qualification Assessment by Media Experts

Aspect	Percentage	Category
Learning	77. 08 %	Good
Writing	66. 66 %	Enough
Infographic	82. 81 %	Very Good

The results of the quality assessment of learning media by material experts and media experts are good overall. The learning aspect received a score of 77,08% with a good category, the writing aspect received a score of 66,66% with a sufficient category, and the evaluation aspect received a score of 82,81% with a good category. Overall, every aspect is judged well. This is possible because the materials that are made can be used properly and have no mistakes when used. The learning media contains quite comprehensive content and presents it with relevant infographics. Table 5 below shows the results of implementation or limited testing to determine the quality of learning media for each aspect.

Table 5. Learning Media Quality Test Results by Class V SD Respondents

Aspect	Percentage	Category
Instructions	93. 9 %	Very Good
Display	93. 6 %	Very Good
Infographic	94. 7 %	Very Good

The results of the evaluation of the quality of the learning media by the students of V grade Sd were reviewed. The display aspect reached 93.6%, the instructional aspect 93.9%, and the soft infographic aspect achieved 94.7%, each achieving excellent categories. Class V SD trial results showed that the lowest percentage of each aspect was the aspect of the display, which reached 93.6% with an excellent category. Students argued that lessons should be added with more interesting content, such as a selection of pictures and writing,

and more diverse colors so that 5th-grade students would be interested in studying the Water Cycle. Students say IPA Media Based Infographic on Water Cycle Materials Grade 5 Basic School is an innovation that is used in classroom learning and is easy to understand, according to the research.

By identifying teaching materials relevant to water cycle learning, this research adds value to the literature. Previous research has highlighted the importance of visual elements and attractiveness in learning at the elementary school level. This discovery is in line with this discovery. (Reizal et al., 2015). The fact that the design of this teaching material uses infographic features supports literary findings that emphasize how effective visual use is in learning (Sutinnah et al., 2020). Its ability to display information about the water cycle using visual media such as images, tables, graphs, and charts is why this material is so important to develop. This is in line with an effort to make education more attractive and interactive. In situations like this, these materials become an inventive alternative to meeting basic student learning needs.

CONCLUSION

Development of IPA Educational Materials Based on Media Infographic on Water Cycle Materials Grade 5 Basic Schools produced the latest teaching materials as well as learning media. The material validation results obtained a percentage score of 80,95% with a good category, and the media validation result obtained a percentual score of 77.94% with the good category. After the implementation of the teaching material in students of 5th grade SD, the quality of the learning media was achieved at 94.73% with good categories. because teaching materials using infographic media can improve the productivity and understanding of students. According to the research that has been done, the advantage of this learning medium is that the teaching material has been supplemented with an interesting infographic overall, and the lesson material is very easy to use and understand. The weakness of the product developed is that infographics only contain information about the water cycle, so the amount of learning material that can be accessed is still limited.

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