



Development of Digital Student Worksheets (LKPD) on Properties of Solid, Liquid and Gas Objects for Class V Elementary Students

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Abstract: *This research aims to see the extent of the LKPD development process on the properties of solid, liquid and gas objects material in the 5th grade of elementary school, as well as finding out the results of the analysis regarding the feasibility and response to product implementation. This research uses the ADDIE model development method which involves questionnaires, tests and several interviews in data collection. The development of digital-based LKPD has very good feasibility. This can be seen from the material expert validity test of 3.8, the language expert test of 3.7, the media expert test of 3.9 and all of them are recommended as very valid and suitable for use. The development of digital-based LKPD has very good effectiveness in learning science material on the properties of solid, liquid and gas objects as assessed from the test results given. The posttest learning results achieved were very significant.*

Keywords: Digitalization, LKPD, science materials

INTRODUCTION

Science learning in elementary schools aims to develop and prepare students to be ready to face the environment. One of the facilities and infrastructure that teachers can use to improve understanding of the Nature of Objects material is by using teaching materials in the learning process. One of the teaching materials that teachers and students can use in the learning process is student worksheets (LKPD) (Darniyanti, 2022). In the science and science learning process, the role of the teacher is so important that teachers need to continuously develop themselves and the learning process they manage. This will have an impact on increasing student activity, creativity, interest and motivation to learn. In turn, it is hoped that student learning outcomes can improve. One effort that teachers can make to reduce

learning boredom among students is by developing teaching materials in various forms of teaching materials. The use of teaching materials is expected to make it easier for students to understand the material provided by the teacher and make it easier for teachers to convey the material to students so that learning objectives are achieved.

Student Worksheets are a type of teaching material that contains materials and questions which can later be used as evaluation material for students to work on based on components such as tasks or exercises, instructions for use, and completion steps. Therefore, the design for making LKPD must pay attention to the components that make up teaching materials in the form of LKPD (Prastowo, 2015: 204). The content of science is a collection of concepts, principles, laws and theories. Science and Technology is education that directs humans to understand the universe through targeted observations, using procedures, and explaining with reasoning so as to reach a (scientific) conclusion (Susanto, 2019: 177).

Based on the results of interviews conducted with the class V teacher at SD Negeri 14 Simpang Pematang regarding the learning tools used, information was obtained that students' learning activities only referred to student textbooks so that students' activities in class were less than optimal. There are no physical or digital Student Worksheets (LKPD) that teachers use in classroom learning, therefore, in carrying out daily assignments and tests related to science and science material, teachers only make their own questions from textbooks (Class Teacher, 2024).

In this research, LKPD will be developed in digital packaging by placing several features that are connected and accessible via websites and the internet. Digital LKPD is an activity sheet presented in computer language in theoretical and practical form which students are expected to be able to study independently (Alda, 2021: 15). Apart from being easy to use, digital LKPD can also be integrated with literacy and creativity skills to explore students' knowledge and skills (Lavtania, 2021:174). This research was designed while following one of the Study Program's road maps, namely Digitalization of Elementary School Learning and Supporting the national vision, namely a Green Economy, by paying attention to the process of educational progress by considering positive commercialization directions but still environmentally friendly.

This research was inspired by Razid's research (2023), which reviewed LKPD research with a scientific approach in schools. Looking at the 4-D research flow used in this research, it is important to develop it using ADDIE's structured steps. Apart from that, this research was also inspired by research by Safitri (2020), this research reviews the development of interactive LKPD based on Problem Based Learning with the application of material in high school. In contrast to this research, it will be researched with material at the elementary school level. Seeing the importance of this development idea, the objectives of this research are 1) To understand the process of developing LKPD products using the ADDIE steps. 2)

Know the results of the analysis regarding feasibility and effectiveness in product implementation

METHOD

The results of this research were tested at an elementary school in Lampung, State Elementary School 14 Simpang Pematang. Research and development time starts from the planning stage, preliminary research stage, learning model development, validation stage, trial and research stage. This research uses the Analysis-Design-Development-Implementation-Evaluation (ADDIE) Model (Nyoman, 2018). The ADDIE model is often used to describe a systematic approach to instructional development. The final result of one stage is the initial product for the next stage. It can be seen in the model image and explanation of the procedure as follows:

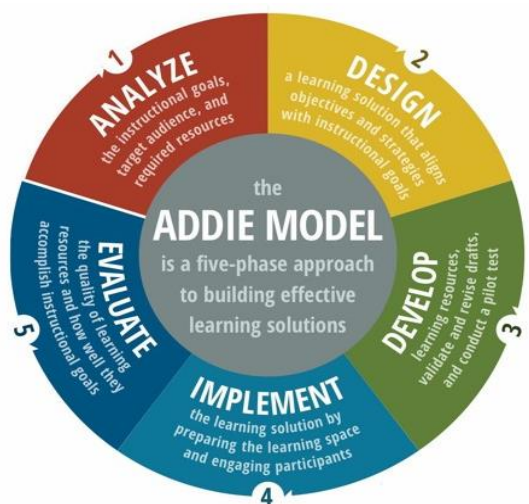


Figure 1.
ADDIE Model Procedure

According to Payne in Wicaksono (2022: 282), the ADDIE model presents an ordered process where progress is directed and/or from one phase to the next, which consists of five steps, namely Analysis, Design, Development, Implementation and Evaluation, the same as Branch's opinion (2009). The data collection tools used were questionnaires, test and interview (Sukma 2020:318). The data analysis technique used in this research is qualitative data analysis by describing opinions and suggestions obtained from the questionnaire sheet (Juwantara, 2023).

RESULT AND DISCUSSION

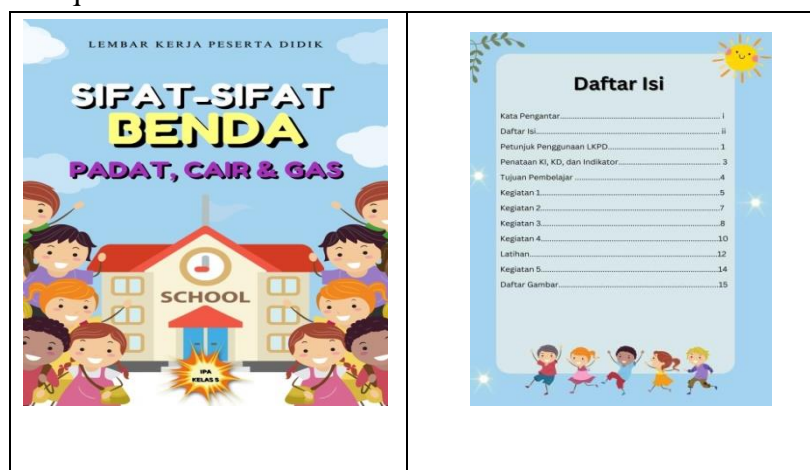
Based on the development research carried out, the following research results were obtained:

Analysis Stage

From the analysis of student needs and character data collected, it shows that science lessons are less popular with students, because learning is still too teacher-centered, there is no variation in learning so that learning goes in one direction which results in students feeling bored with learning activities. Elementary students are at the concrete operational stage, so they need variations that can help students' interpretation in understanding the material. At the curriculum analysis stage, the first learning achievement is analyzing the influence of heat on changes in temperature and shape of objects in daily life and reporting the results of experiments on the influence of heat on objects.

Design Stage

Digital-based LKPD design begins with determining the LKPD cover that can attract students' attention to read it. The LKPD cover is designed in A4 size, consisting of the LKPD title, material to be discussed, subject and class. To make the design look more attractive, images are used that relate to the properties of solid, liquid and gas materials and choose bright cover colors. The content design of the LKPD is also designed to be attractive by planning the content in the presentation of the material and is equipped with pictures related to the properties of solid, liquid and gas objects. The contents of the LKPD are designed in A4 size consisting of 21 pages consisting of title, student name, foreword, table of contents, student LKPD guidelines, teacher LKPD guidelines, learning objectives, learning activities, game activities, practice questions and activities.



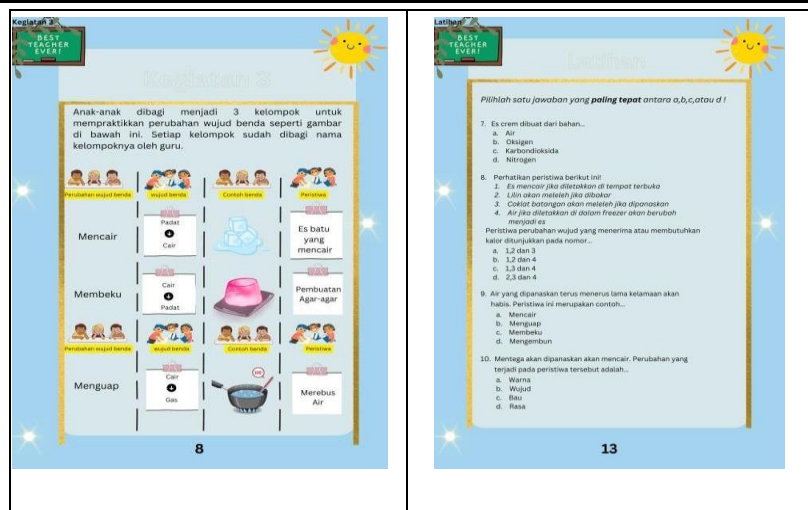


Figure 2.
LKPD Design

Development stage

The development stage is realizing the design that is made into a product. The things that are done in development include: typing the content in the LKPD, inserting features and images related to the material, and giving attractive colors to each page. The process of making this LKPD uses the Canva Pro application. Then search and collect data from various relevant sources to enrich the material used in the LKPD. At this stage, adjustments to the images and content in the LKPD related to students' daily lives are also developed regarding the material on the properties of solids, liquids and gases to make it easier to understand the material. Editing and setting the layout of the LKPD is also developed by designing an appropriate placement layout so that it looks beautiful and attracts the attention of students reading the LKPD.

To strengthen development, validation was also carried out by several experts, starting sequentially from material, language and media validation (rasio: 1-4).

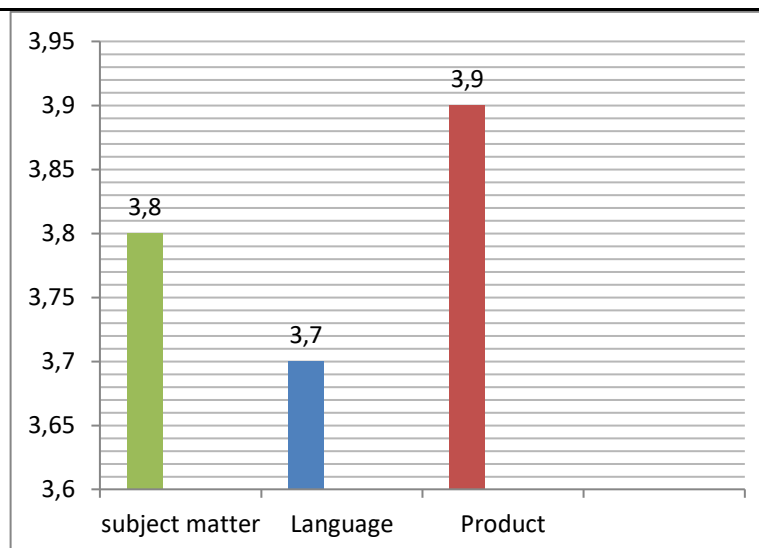


Figure 3.
Expert Validation

Implementation Stage

At this stage, the development results are tested to determine student responses to the digital-based LKPD that has been developed. From student responses from the 3 aspects assessed, an average total score of 3.8 was obtained in the "very practical and suitable for use" category. This means that the development of digital-based LKPD products is assessed by students as additional teaching material that is very practical to use in class V elementary school material on the properties of solids, liquids and gases.

No	Rated aspect	Score
1	Operation of LKPD	3,9
2	Reaction to use	3,9
3	Benefits of Digital LKPD	3,7
Average		3,8
Very Practical		

Table 1. User Response

Evaluation Stage

In the evaluation stage, students' understanding of the product content is tested through tests given. The test results are an illustration of the extent to which students understand the content of the material that has been presented. The test results that have been obtained from the pretest and posttest questions presented to all students are 50% of the students' pretest. The learning outcomes achieved in this pretest were categorized as quite effective, meaning that student learning outcomes

in science learning on the properties of solid, liquid and gas objects were not as expected. Then the learning outcomes achieved in this posttest were categorized as very effective, meaning that student learning outcomes in science learning on the properties of solids, liquids and gases were as expected, this means that the use of digital-based LKPD was effectively used in the learning process. This research also proves that trials by previous researchers, namely Wahyu Purwaningrum (2022), show that it has a positive impact on children's learning processes and outcomes.

CONCLUSSION AND SUGGESTION

The development of digital-based LKPD has very good feasibility. This can be seen from the material expert validity test of 3.8, the language expert test of 3.7, the media expert test of 3.9 and all of them are recommended as very valid and suitable for use. The development of digital-based LKPD has very good effectiveness in learning science material on the properties of solids, liquids and gases as assessed by the results of the tests given. The posttest learning results achieved were very significant.

AUTHOR'S CONTRIBUTION

In this research, Ena acts as a researcher and data collector. Meanwhile, Ambyah, Ridho and Connyta contributed in analyzing research results, adjusting templates, and compiling articles.

REFERENCES

- Alda, Safria. (2021). Pengembangan Lkpd Berbasis Digital Pada Materi Sejarah Di Kelas IV SD Negeri 72 Banda Aceh. Universitas Bina Bangsa Getsempena Banda Aceh.
- Branch, R.M. (2009). *Instructional Design: The ADDIE Approach*. Boston, MA: Springer US.
- Darniyanti, Yulia. (2022). Pengembangan Lembar Kerja Peserta Didik (Lkpd) Muatan Ipa Berbasis Problem Based Learning (PBL) Kelas V Sekolah Dasar Negeri 25/VIII Bungo Tanjung Kabupaten Tebo. *Jurnal Pendidikan dan Konseling* Volume 4 Nomor 6.
- Andriyani, N., Hanafi, Y., Safitri, I., & Hartini, S. (2020). Penerapan Model Problem Based Learning Berbantuan Lkpd Live Worksheet Untuk Meningkatkan Keaktifan Mental Siswa Pada Pembelajaran Tematik Kelas VA SD Negeri Nogopuro. *Prosiding Pendidikan Profesi Guru, Fakultas Keguruan dan Ilmu Pendidikan, UAD*. 122-130.
- Juwantara, R., Harjanto, A., Sutiyono, A., & Utari, D. 2023. (); Development of Contextual Learning-Based E-Module in Elementary School. *JIP Jurnal Ilmiah PGMI*, 9(1), 72-81. <https://doi.org/https://doi.org/10.19109/jip.v9i1.18286>

- Lavtania, Neysia. (2021). *Pengembangan LKPD Digital Menggunakan Pendekatan Saintifik Berbasis Kreativitas Mata Pelajaran Kimia Materi Pembuatan Makanan Berupa Koloid*. Jurnal Inovasi Pendidikan Sains, Vol. 12, No. 2.
- Nyoman Sugihartini, Kadek Yudiana. Jurnal Pendidikan Teknologi Dan Kejuruan Vol. 15, No. 2, Juli 2018, Hal :277 P-Issn : 0216-3241 ; E-Issn : 2541-0652 <https://ejournal.undiksha.ac.id/index.php/jptk/issue/view/851> Addie Sebagai Model Pengembangan Media Instruksional Edukatif (Mie) Mata Kuliah Kurikulum Dan Pengajaran. Fakultas Teknik Dan Kejuruan, Universitas Pendidikan Ganesha
- Razid Ananda Siregar. Development of E-LKPD Based on A Scientific Approach for Students of MAN 2 Model Medan Universitas Negeri Medan Indonesian Journal of Advanced Research (IJAR) Vol. 2, No. 4, 2023: 237 – 252. DOI: <https://doi.org/10.55927/ijar.v2i4.3768> ISSN-E: 2986 - 0768 <https://journal.formosapublisher.org/index.php/ijar>
- Sukma. 2020. Effectiveness Of Outdoor Learning Optimization Program In Learning Social Studies. JPI, Vol. 9 No. 2, June 2020p-ISSN: 2303-288X, e-ISSN: 2541-7207 DOI: 10.23887/jpi-undiksha.v9i2.19160 Jurnal Pendidikan Indonesia (JPI).
- Susanto, Ahmad. (2019). *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta : Prenadamedia Group.
- Wicaksono, Andri. (2022). *Metodologi Penelitian Pendidikan*. Yogyakarta. Garudhawaca.