Alacrity : Journal Of Education
e-ISSN : 2775-4138
Volume 5 Issue 1 February 2025
The Alacrity : Journal Of education is published 4 times a year in **(February, June, October)**
Focus : Learning, Education, Including, Social, Curriculum, Management Science, Educational Philosophy And Educational Approaches.
LINK : http://lpppipublishing.com/index.php/alacrity

Development Of Liveworksheets Based Learning Materials in Class V Sciences Learning of Sukarejo State Elementary School

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ARTICLE INFO
Article history:
Received
26 Desember 2024
Revised
25 Januari 2024
Accepted
20 Januari 2025

ABSTRACT

The research aims to develop a product of teaching materials based on Liveworksheets for learning science, particularly social studies materials for grade V elementary school students. This study was conducted to evaluate the validity of the teaching materials through validation assessments from material experts, language experts, and teaching material experts, as well as to assess their practicality. The study uses the Research and Development (R&D) approach, employing the ADDIE model, which includes five phases: Analysis, Design, Development, Implementation, and Evaluation. The data collection methods include observation, interviews, documentation, and validation questionnaires for experts, along with response questionnaires for teachers and students. The validation results from material experts showed a percentage of 88% in the "very valid" category, while language experts achieved 90% in the "very valid" category, and teaching material experts scored 80% in the "valid" category. Based on feedback from practitioners through the teacher and student response questionnaires, teacher responses received 89% in the "very practical" category, while student responses reached 93.46% in the "very practical" category. Based on the assessment results of the Liveworksheets-based teaching materials, it can be concluded that these materials are highly suitable for use in grade V science education. For future researchers, it is advisable to conduct field trials to measure the effectiveness of the teaching materials and to develop Liveworksheets-based teaching materials for various subjects in elementary schools.

Keywords *Teaching Materials, Liveworksheets, Development.*

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INTRODUCTION

The 21st century is an era of digitalization, where almost all aspects of life, including education, depend on digital technology. Digitalization is a transformation process that changes activities from being conventional to being

fully digital (Maisarah & Prasetya, 2024, p. 3119). The current digital era has made life activities highly dependent on digital technology, including those in the education sector (Fransyaigu et al., 2024, p. 37).

The rapid development of science and technology in the digital era of the 21st century has also led to the digitalization of the education sector, which includes various aspects, ranging from school administration and management systems to the learning process and student learning evaluation (Ayudia et al., 2023, p. 49). Learning will continue to evolve in response to the dynamic changes driven by the development of science and technology (Juliati, 2023, p. 11). This is because the 21st century demands significant changes in all aspects of life, especially in education and learning (Mulyahati & Fransyaigu, 2018, p. 11).

In the context of learning, digitalization provides a great opportunity to create a more efficient and engaging learning experience. Digital-based learning utilizes digital technology to enhance the learning experience. This innovation allows learning materials to be accessed quickly, communication between teachers and students to become smoother, and the availability of learning devices and platforms to support the teaching and learning process (Sahudra et al., 2024, p. 500). This undoubtedly provides enormous benefits for teachers in utilizing technology for the learning process (Aprilia & Mahlianurrahman, 2023, p. 55).

One of the subjects that can utilize technological advances in its learning process is Natural and Social Sciences (IPAS). IPAS itself is a combination of IPA (Natural Sciences) and IPS (Social Sciences) with the aim of creating a more comprehensive, multidisciplinary, and relevant education in the context of life. Through this integration, the two subjects are not taught independently, but are linked, enabling students to better grasp the connection between natural and social phenomena (Suhelayanti et al., 2023, p. 3).

Along with the development of digital technology, science and natural science education must also be adapted to better meet the needs of students in the current digital era. Although science and natural science education integrates interrelated natural and social science concepts, conventional teaching methods are still used in many schools, often failing to convey the relationship between the two in a way that is both effective and engaging. Many teaching methods have not fully utilized the potential of technology, resulting in reduced student interest in learning (Kuway et al., 2023, p. 3871). Teachers need to be more effective in implementing new learning tools to foster students' interest in learning (Ayudia, 2022, p. 85). Students' interest in learning can be observed through various aspects of the teaching and learning process,

such as curriculum development, the use of learning models, the choice of teaching methods, the application of teaching materials, and other factors (Kenedi et al., 2018, p. 226). This is crucial in achieving the goals of education, which are to educate students and ensure that learning is carried out effectively (Asnawi et al., 2024, p. 864). The quality of education is greatly influenced by the extent to which teachers can design and deliver effective teaching (Kenedi et al., 2021, p. 2396). Teachers do not simply convey learning materials to students; they also fulfill professional duties that require them to integrate fundamental teaching skills comprehensively (Fransyaigu & Mulyahati, 2018, p. 53). One of these skills is the ability to implement technology-based digital learning to ensure that learning objectives are achieved (Sahudra et al., 2024, p. 91). Improving the quality of learning must align with the demands of 21st-century developments (Mulyahati, 2023, p. 63).

Based on a preliminary study conducted at Sukarejo Elementary School in science learning, the teaching materials used in the learning process consist solely of printed books. During lessons, students are only asked to read these printed books. The teacher then explains the material that the students have read, which limits students' opportunities to explore the learning materials on their own, especially in social studies. In science lessons, particularly social studies, there are several topics that discuss the culture of the area, and teaching materials are needed to address the content effectively for the students. Additionally, the current generation is growing up amid technological advances, where the internet, social media, and technology have become an inseparable part of their daily lives.

For this reason, the use of technology-based platforms, such as Liveworksheets, is a highly relevant solution in the development of learning tools, one of which is digital-based teaching materials for science education. Liveworksheets is an online platform that makes it easy for teachers or educators to access available E-LKPD and convert it into an interactive digital format. With this interactive LKPD, the learning process becomes more varied, interesting, and easier for students to understand (Maisarah et al., 2024, p. 48). By using technology-based teaching materials, students will have a different experience than before (Aprilia & Hartutik, 2024, p. 1527), and this encourages them to further develop their knowledge and skills (Sukirno et al., 2020, p. 436).

The implementation of the Liveworksheets platform in science learning at SD Negeri Sukarajo is a step in the right direction to address existing challenges. This platform makes it easy for teachers to develop relevant digital-based teaching materials, supported by rapid technological developments (Sidiq et al., 2023, p. 7651). Liveworksheets-based teaching materials allow

students to easily access materials, complete exercises independently, and receive immediate feedback, which greatly supports an active and constructive learning process. With the interactivity in the teaching materials, it is hoped that students will not only gain knowledge but also better understand the relationship between natural and social sciences in the context of their real lives (Sari & Purwaningsih, 2023, p. 16). In addition, teachers are expected to foster student enthusiasm through positive changes (Sidiq et al., 2022, p. 31).

Referring to the background explained above, this study aims to develop Liveworksheets-based teaching materials for science learning for fifth-grade students at Sukarejo State Elementary School.

RESEARCH METHOD

This research uses the Research and Development method. According to Riyani et al. (2020, p. 47), research and development is a type of research aimed at producing specific products. The procedure in this study follows the ADDIE model, which includes five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is one of the most frequently applied models in instructional design to create effective and efficient designs (Kenedi et al., 2018, p. 32).

The data collection methods used in this development research include observation, surveys, interviews, and documentation. The collected data are then analyzed using both qualitative and quantitative analysis techniques. Qualitative data analysis includes data obtained from observation results, teacher interviews, and questionnaires in the form of suggestions and input from validators. Quantitative data analysis is used to analyze data in the form of questionnaire results with a scale of 1-5 (Juliati et al., 2024, p. 583). The feasibility and practicality of the resulting product are analyzed using percentages (Mahlianurrahman, 2017, p. 94). The calculation formula for quantitative data to determine the validity and practicality of the LKPD developed is as follows.

$$P = \frac{F}{N} \times 100\%$$

P = Percentage
F = Total Score from validator
N = Maximum Score Value

Table 1.
Validity and Practicality Criteria

Percentage	Criteria
81% - 100%	Very Valid/Practical
61% -80%	Valid/Practical

41% - 60%	Quite Valid/Practical
21% - 40%	Less Valid/Practical
0 – 20%	Not Valid/Practical

Source: Riduwan (2016)

RESULT AND DISCUSSION

Analysis Stage

The researcher conducted an observation of the science learning process in grade V at Sukarejo State Elementary School as an initial step to obtain data. At this analysis stage, interviews were also carried out to gather information from the homeroom teacher and students (Putra et al., 2023, p. 260). This is in line with the opinion of Riyani et al. (2020, p. 14), who state that observations are conducted to obtain research data.

a) Curriculum analysis

Based on the interview with the homeroom teacher of grade V, the school has implemented the independent curriculum; however, in the learning process, the teacher sometimes still uses the 2013 curriculum book. This is because the research was conducted during the school's transition period from the 2013 curriculum to the independent curriculum. According to Ramadhani et al. (2023, p. 23), when selecting materials, teachers need to determine and develop content that aligns with the established performance indicators. The material selected in this study is social studies learning content that adapts to the independent curriculum. Social studies subjects have been integrated into the Natural and Social Sciences (IPAS) subject area, with the Learning Outcome (CP) being "Students recognize the diversity of national cultures in relation to the context of diversity".

b) Needs Analysis

Based on the results of interviews conducted with the homeroom teacher of grade V, it was found that students become bored when the teacher only explains the material. Additionally, there is a lack of supporting books or teaching materials related to topics that discuss the students' environmental culture. It was also revealed that teachers have never used or created digital teaching materials for the learning process due to time constraints and a lack of understanding in creating digital teaching materials. Therefore, teachers need an innovation in the learning process that aligns with current technological developments, specifically by using digital teaching materials. The researcher also conducted interviews with fifth-grade students of Sukarejo State Elementary School. It was found that students tend to prefer learning that incorporates videos or images. Students also tend to feel bored

with Social Sciences (IPS) material because the teacher only explains the content without using supporting materials such as images or videos. In addition, it was found that fifth-grade students are accustomed to using technology, such as mobile phones or computers. Based on this analysis, the researcher developed digital teaching materials, specifically Liveworksheets website-based teaching materials, to make the learning process more interesting, varied, and to increase students' enthusiasm for learning IPAS, especially in IPS material.

Design Stage

a) Preparation of Materials

Subject matter refers to information that must be conveyed to students (Asnawi et al., 2023, p. 408). Delivering material is not just an obligation or task that must be prepared daily, but also an interaction between teachers and students aimed at achieving learning goals (Mahlianurrahman, 2017, p. 59). When compiling materials, there are many factors that must be considered, such as selecting references, choosing images, and selecting videos that are appropriate for the material. After selecting appropriate references related to the Langsa City Community Culture, the researcher summarized and compiled the material according to the Learning Objective Flow (ATP) in the form of a file. Next, the researcher designed or sketched the appearance of the teaching materials. Then, they gathered and selected appropriate images and videos to support the material.

b) Planning of Teaching Materials Based on Liveworksheets

The researcher created a design in the form of a sketch of the teaching material, which was used to describe the process of making teaching materials. The sketch was created in a storyboard format.

c) Preparation of Digital Teaching Material Assessment Instruments

The creation of teaching material instruments based on Liveworksheets consists of product feasibility questionnaires and practicality questionnaires. The data for the product feasibility questionnaire is gathered from the validation results provided by material experts, language experts, and teaching material experts. Meanwhile, the data from the practicality questionnaire comes from student and teacher response questionnaires.

Development Stage

This stage is carried out to develop the designed product, which is digital teaching material, through the production process. Before being tested with students, the teaching material must first be validated by experts or validators to assess its suitability. Validation ensures that the developed teaching material

meets the established standards of quality before it is tested on students (Sukirno et al., 2020, p. 211).

1) Validation by Material Experts

   The validation of the material was carried out by Dr. Asnawi, S.Pd., M.Pd. The material expert conducted the validation related to the suitability of the material, its benefits, and evaluation.

Table 2.
Results of Validation by Material Experts

Stages	Percentage	Information
Phase I	84%	Very Valid
Phase II	88%	Very Valid

   Based on the table, the validation of the material was carried out in two stages. In the first stage of material validation, a percentage of 84% was categorized as very valid, and in the second stage, a percentage of 88% was categorized as very valid.

2) Linguist Validation

   The language expert for this Liveworksheets-based teaching material was validated by Mrs. Juliati, S.Pd., M.Pd. The validation carried out included aspects of straightforwardness, communicativeness, interactivity, dialogicity, conformity with language rules, and the use of symbols.

Tabel 3.
Linguist Validation Results

Stages	Percentage	Information
Phase I	78%	Valid
Phase II	90%	Very Valid

   According to the table, the language validation process was conducted in two phases. During the first phase, 78% of the results were classified as valid, while in the second phase, 90% were classified as very valid.

3) Validation of Teaching Materials Experts

   Validation of this teaching material was carried out by one of the lecturers from the Elementary School Teacher Education program, namely Mrs. Inge Ayudia, S.Pd., M.Pd. The validation conducted by teaching material experts was related to aspects of the teaching material cover design and content design.

Table 4.
Results of Validation by Teaching Material Experts

Stages	Percentage	Information
Phase I	67,27%	Valid
Phase II	80%	Valid

According to the table, the validation of teaching materials took place in two phases. In the first phase, 67.27% of the materials were classified as valid, while in the second phase, 80% were classified as valid.

Implementation Stage

The implementation stage refers to the process of directly applying the developed teaching materials in the classroom (Putra et al., 2023: 7653). This stage is carried out by implementing the product to assess the practicality of the developed teaching materials. After completing the implementation of the teaching materials in the classroom, the researcher distributed questionnaires to students and teachers. These questionnaires were intended to gather the responses of students and teachers after the implementation of the teaching materials.

1) Student Response Questionnaire
   The results of the practicality calculation of teaching materials, based on student feedback, are divided into three aspects: ease of use, usefulness, and satisfaction. In the ease of use aspect, a percentage of 93.85% was obtained in the very practical category; in the usefulness aspect, a percentage of 90% was obtained in the very practical category; and in the satisfaction aspect, a percentage of 96.66% was obtained. From these three aspects, an average percentage of 93.46% was calculated. It can be concluded that the developed teaching materials are extremely practical for student use.
2) Teacher Response Questionnaire
   In this study, a practitioner was involved, namely a teacher named Ade Yusfiana, S.Pd. In this questionnaire, the practitioner was required to fill out a questionnaire related to the aspects of ease, usefulness, and satisfaction with the product being developed. In the ease aspect, a percentage of 83.2% was obtained in the 'very practical' category; in the usefulness aspect, a percentage of 84% was obtained in the 'very practical' category; and in the satisfaction aspect, 100% was obtained in the 'very practical' category. The three aspects had an average of 89%. In conclusion, the developed teaching materials are highly practical for use in learning.

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Evaluation Stage

This stage involves an analysis of improvements to deficiencies at each step, aimed at revising the developed teaching materials. The evaluation also aims to determine the level of feasibility and practicality of the digital teaching materials for grade V at Sukarejo State Elementary School. At the analysis stage, information was gathered related to learning problems, student needs, and teacher needs, which required supporting materials for the learning content and innovations aligned with the use of current technology that need to be evaluated to find solutions to existing problems. The researcher's solution is to develop teaching materials based on Liveworksheets for teaching Natural and Social Sciences (IPAS).

Evaluation at the design stage involves designing teaching materials, consulting with the supervisor, and then creating the teaching materials as a whole. In contrast, evaluation at the development stage is conducted by comparing the feasibility results obtained from the validation questionnaires of material experts, language experts, and teaching material experts. The assessment of language validation is related to aspects such as straightforwardness, communicativeness, interactivity and dialogicity, material suitability with language rules, and the use of symbols or icons. The assessment of teaching material validation is related to aspects of cover design and content design. The assessment of student and teacher response questionnaires is related to aspects of ease, usefulness, and satisfaction.

Table 5.
Eligibility of Teaching Materials from Validators

No	Validators	Percentage	Criteria
1.	Subject Matter Expert	88%	Very Valid
2.	Linguist	90%	Very Valid
3.	Teaching Materials Expert	80%	Valid
Average		86%	Very Valid

The table above displays the results of the feasibility assessment conducted by the validators, which yielded an average of 86% in the “very valid” category.

At the implementation stage, the evaluation conducted involves comparing the results of practicality obtained from teacher and student response questionnaires. The assessment of material validation includes indicators of material suitability, benefits, and evaluation.

Tabel 6.
Practicality of Teaching Materials

No	Validators	Percentage	Criteria
1.	Teacher Response Questionnaire	89%	Very Practical
2.	Student Response Questionnaire	93,46%	Very Practical
Average		91,23%	Sangat Praktis

The table above shows the results of the practicality assessment of teaching materials based on teacher and student responses, which found an average practicality of 91.23% in the 'very practical' category.

CONCLUSION

The development process is carried out using the ADDIE model. The first stage is the analysis stage, which involves conducting a needs analysis and curriculum analysis obtained from interviews and observations. The second stage is the design stage, which includes creating a storyboard, selecting references related to the material, and choosing a background and photos or videos that align with the material. The third stage is the development phase, where the product is created based on the design from the previous stage. It is then validated by material experts, language experts, and teaching material experts, followed by improvements to ensure product validity. The fourth stage is the implementation phase, and the final stage is the evaluation phase.

The suitability of the teaching materials is determined by the assessment of lecturers who are experts in the material, language, and teaching methods.

a) The feasibility assessment by material experts was carried out in two stages. In Stage I, the percentage was 84% in the very valid category, and in Stage II, the percentage was 88% in the very valid category.
b) The eligibility assessment by language experts was carried out in three stages. In Stage I, 78% of the linguists were found to be in the valid category, and in Stage II, 90% were found to be in the very valid category.
c) The feasibility assessment by teaching material experts was carried out in two stages. In the expert validation of teaching materials in Stage I, they obtained 67.27%, with the criteria being feasible but needing revision,while in Stage II, 80% were categorized as very feasible.

The practicality of the teaching materials was determined based on responses from teachers and students through questionnaires during the trial.

a) Based on the student response questionnaire, covering the aspects of ease, usefulness, and satisfaction, an overall average of 93.46% was categorized as very practical.
b) Based on the teacher response questionnaire, covering the aspects of convenience, usefulness, and satisfaction, an overall average of 89% was categorized as very practical.

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