Development of 'Kenalin' Learning Media Based on the Smart Apps Creator Application to Improve Student Learning Outcomes in Class IV Elementary School Science Subjects

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Abstrak: Science and Technology learning in class IV at SD Negeri Kandri 01 is still not optimal in the use of IT-based learning media. This affects the learning outcomes of students who have not met the KKTP. This research aims to develop, and test the feasibility, and effectiveness of the "Kenalin" learning media based on the Smart Apps Creator application for the material Indonesiaku Kaya Budaya and also to find out whether the 'Kenalin' learning media can significantly improve student learning outcomes. This type of research is Research and Development (R&D) with the Borg and Gall development model. Using test techniques (pretest and posttest) and non-test techniques (observation, interviews, initial data analysis, and final data analysis). The data analysis method used in this research includes initial data analysis using the normality test, as well as final data analysis using the average difference test using the T-Test and measuring the average increase using N-Gain. Based on the results of material validation and media validation, it was found that the 'Kenalin' media met the standard criteria for being very worthy with a score of 92.50% from material expert validators and 95% from media expert validators. The effectiveness of using the 'Kenalin' media was assessed by comparing the pretest and posttest scores using the N-Gain test which obtained a score of 0.58 which was included in the medium category and the paired simple test obtained a result of 0.000 <0.005, so Ho was rejected and Ha was accepted. This research concludes that the "Kenalin" learning media based on Smart Apps Creator is suitable and effective for use as a learning media for the material My Indonesia is Rich in Culture, student learning outcomes also show a significant improvement.

Keywords: IPAS; Learning Results; Rich in Culture; Smart Apps Creator

Introduction

Education is one of the most important things for advancing the quality of human resources in a country, this has been regulated in the 1945 Constitution of the Republic of Indonesia clarifying the objectives of education in Indonesia. Contained in CHAPTER All Indonesian citizens have received educational guarantees which are contained in the 1945 Constitution of the Republic of Indonesia Article 31, namely paragraph (1) Every citizen has the right to education. Paragraph (2) Every citizen is obliged to attend basic education and the government is obliged to finance it. So it can be concluded that every citizen

has the right to receive adequate education and the state guarantees the availability of adequate facilities.

Based on the Minister of Education, Culture, Research and Technology Regulation Number 16 of 2022 concerning Process Standards for Early Childhood Education, Basic Education Levels, and Secondary Education Levels, it states that important points include: the learning approach must be student-centered; active, creative and fun learning; meaningful learning; integrated learning; use of information and communication technology; continuous and authentic assessment. It is hoped that this regulation can improve the quality of the learning process in Indonesia and produce graduates who are competent and have character (S. M. Sari & Ganing, 2021); (Parwati & Suastra, 2024).

The curriculum currently being implemented at the education level in Indonesia is an independent curriculum to improve the previous curriculum (Sugih et al., 2023); (Rohmah et al., 2024); (Lestari et al., 2023). Based on Permendikbudristek Number 56 of 2022 concerning Guidelines for Implementing Curriculum in the Context of Learning Recovery, it is stated that the independent curriculum is an operational curriculum prepared by educational units based on the basic framework and curriculum structure provided by the Ministry of Education and Culture. The Merdeka Curriculum which is applied at the educational level, with the concept of independent learning, gives the meaning of 'independence' to educational actors, especially teachers and school principals in terms of organizing, developing, and implementing the curriculum based on the potential and needs of students and schools (Indarta et al., 2022); (Rahmadayanti & Hartoyo, 2022); (Bredeson, 2000). The independent curriculum at the elementary school level provides many changes in terms of subjects that students must take. One of them is the combination of science subjects with social studies which was then adapted in the independent curriculum to become science subjects.

Natural and Social Sciences (IPAS) is a scientific field that investigates the interactions between living things and inanimate objects in the universe. It also looks at human life as both an individual and a social organism that adapts to its surroundings (Rahmayati & Prastowo, 2023); (Fan et al., 2021). The Pancasila Student Profile, which is a perfect representation of the profile of Indonesian students, is realized in part through the scientific and science-related topics in the autonomous curriculum. IPAS fosters pupils' inquisitiveness about things that happen in their environment. Students' understanding of the workings of the universe and how it interacts with

Earthly existence might be sparked by their curiosity. By following the guidelines provided this knowledge may be utilized to identify various issues encountered and discover solutions to attain sustainable development goals.

The Smart Apps Creator application can help teachers create effective learning media used in elementary schools so that teachers don't just use lecture models in the learning process (Syadida, 2022); (Suhartati, 2021); (Nguyen et al., 2022). Therefore, research and development of learning media has an important role in creating learning experiences on Indonesiaku Kaya Budaya material. This research aims to explore the design, feasibility, and effectiveness of the 'Kenalin' learning media to improve the learning outcomes of fourth-grade elementary school students in Natural and Social Sciences (IPAS) subjects.

Method

Research and development (R&D) is the sort of research for which a quantitative method was applied in this study. The development model used in this study is based on the ten-step model developed by Borg and Gall; however, due to time and budgetary constraints, the researcher was only able to complete phases 8 through 10. The steps are as follows: Potential issues and challenges are listed first, followed by data collection, product design, design validation, design revision, product testing, product revision, and trial use. Indonesiaku Rich in Culture materials are used in class IV primary schools as research and development materials for Smart Apps Creator-based science learning media.
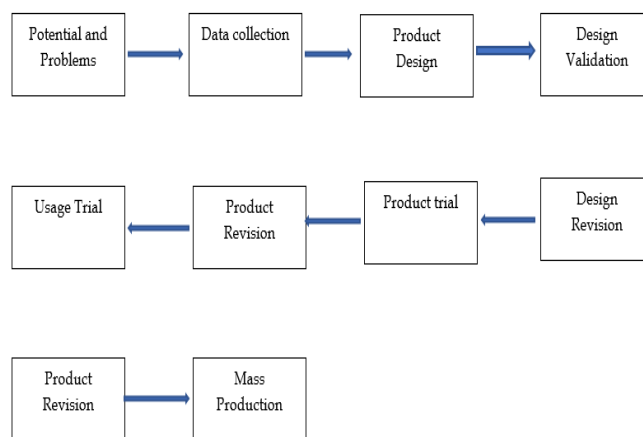

Figure 1. Steps method Research and Development (R&D)

The data collection technique used is a test technique consisting of *a pretest* and *posttest,* as well as a

non-test approach through interviews, observation, questionnaires, and documentation. Initial data analysis begins with a normality test to determine whether the data is normally distributed or not and final data analysis to determine differences in learning outcomes when using the 'Kenalin' media is carried out using the T-Test and N-Gain test to determine the increase in student learning outcomes. Research design and methods must be clearly defined.

Result and Descussion

Eight of the ten development steps were used by the researchers, based on the Borg and Gall development stages that have been explained. To facilitate learning and enhance the learning outcomes of class IV students at SD Negeri Kandri 01 on the topic Indonesiaku Rich in Culture, researchers created a learning medium based on Smart Apps Creator, which they titled "Kenalin."

Potential Problem Stage

The researcher analyzed the potential and problems from the results of the needs analysis at the start of the research through observations and interviews with class IV teachers at SD Negeri Kandri 01. In this analysis, it was found that the curriculum used was the Merdeka Curriculum which has been running for the past 2 years. In its implementation, there are still several problems, including the lack of learning media in schools and the use of learning media which still does not make much use of technology. This is what makes students easily bored, bored, and their interest (motivation) in learning is low so students have difficulty understanding and accepting the lesson material. This affects the learning outcomes obtained by these students. Schoolchildren aged around 7-11 years are included in the concrete operational phase. In this phase, a child can make conclusions from things in real situations or with the help of concrete objects. In accordance with the problems obtained, the researcher developed learning media which the researcher named 'Kenalin' based on Smart Apps Creator for class IV SD Negeri Kandri 01, Indonesiaku Rich in Culture material.

Data Collection Stage

Researchers collect data to plan product creation. The data collected was in the form of student learning outcomes in science and science subjects, interviews with teachers who discussed problems in class IV, as well as a needs questionnaire that researchers distributed to teachers and students. The data that has been collected is then analyzed to prepare the material and content that will be displayed on Smart Apps Creator-based research media.

Product Design Stage

At this stage, the researcher begins to create designs regarding the media that will be developed. Researchers use the help of the Canva application to facilitate the media design process. The steps in preparing media creation are determining the material and content that you want to include, and looking for media display elements. In the media that researchers have developed, there are displays of Instructions. Menus, Learning Outcomes, Learning Objectives, and Materials, and there are evaluation questions that students will work on at the end of the lesson. There are questions at the end of the media that researchers have developed so that teachers know the level of students' understanding of the material presented. The 'Kenalin' application that the researchers developed can be played individually or in groups, according to the learning model used by the teacher. The design of the 'Kenalin' learning media design can be seen in the following image.

Figure 2. Cover
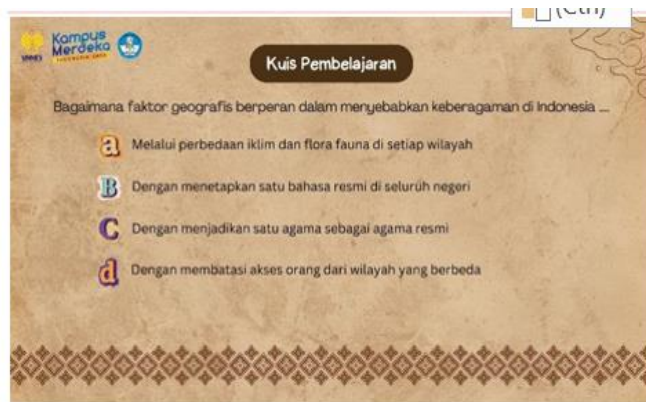

Figure 3. Instructions Display

Figure 4. Menu display

Figure 5. Material

Figure 6. Example of Local Wisdom

Figure 7. Cultural Diversity

Figure 8. Learning Quiz Display

Product Design Validation Stage

The 'Kenalin' learning media product based on Smart Apps Creator is assessed by material and media experts to determine its level of validity. This is done to find out whether the product that the researcher created is feasible or not. The material expert validation instrument consists of 3 aspects with 10 indicators, while the media expert validation instrument consists of 5 aspects with 15 indicators. The scores that have been obtained are then processed in the form of percentages with very decent criteria with a score range between 76% - 100%, decent criteria with a score range of 51% -75%, fairly decent criteria with a score range between 26% -50%, inadequate criteria with a score range of 0% 25%. Based on the results of the material expert recapitulation, the 'Kenalin' learning media based on *Smart Apps Creator* received a percentage of 92.5% with Very Eligible criteria. Meanwhile, the results for the recapitulation of media experts' assessments of the 'Kenalin' learning media based on *Smart Apps Creator* obtained a percentage of 95% with Very Eligible criteria. In this way, it can be concluded that the 'Kenalin' media that the researchers developed is very suitable for use in science and science learning in class IV elementary schools.
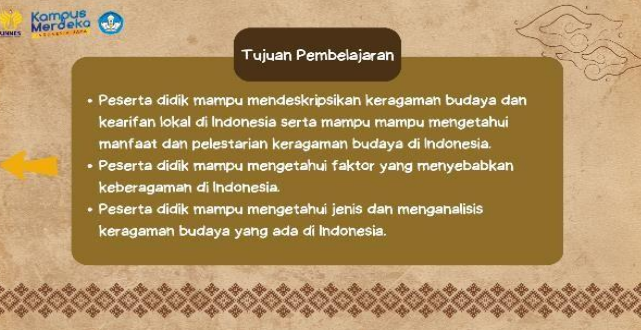
Table 1. Expert Validation Results

Validation	Maximum Score	Total Score	Score Percentage %	Criteria
Materials Expert	40	37	92.50	Veryworthy
Media Expert	60	57	95	Veryworthy

Design Revision Stage

The fifth stage is to refine the design based on suggestions and input provided by media and material expert validators as an effort for researchers regarding the 'Kenalin' learning media. The results of improvements based on expert corrections are as follows :

Table 2. Results of improvements based on expert corrections

Revision

Before Revision	After Revision

Trial Phase

The small-scale trial phase was carried out in class IV of SD Negeri Kandri 01, Semarang City, involving 6 student samples from a total of 28 students. The aim of this small-scale trial stage is to find out what obstacles will occur and how to minimize them when used in large-scale trials later. The sample was selected using the *Purposive Sampling technique*, namely on the basis of classranking, 2 students ranked at the bottom, 2 students ranked in the middle, and 2 students ranked at the top. At the beginning of learning, students are directed to work on *pretest questions* to determine the student's initial abilities before receiving material using the 'Get to Know' learning media. At the end of the lesson, the researcher directed students to work on *posttest questions* to see whether there was a change in students' knowledge after learning using the 'Kenalin' learning media based on *Smart Apps Creator*. The result was that

there was an increase before and after learning using 'Kenalin' media where the average obtained by students was from 51 to 85. The result data from the pretest and posttest on the small-scale trial are presented in Table 3.

Table 3. Small Scale Test Scores

Action	Lowest Score	Highest Score	Average Score
Pretest	35	65	51
Posttest	80	95	85

Product Revision Stage

The goal of the product revision step was to enhance the "Kenalin" medium in response to input gathered from the small-scale testing stage. There was no need for correction or improvement because teachers and students responded favorably to the "Kenalin" medium in small-scale trials.

Use Trial Phase

A comprehensive evaluation of the 'Kenalin' media's efficacy in raising student learning results in Indonesian Kaya Budaya material for science and science class IV SD Negeri Kandri 01 required extensive testing. Using the 'Kenalin' media and questions, class IV students first responded to the pre-test questions in this testing phase. posttest following the use of the "Know" resources. Students' average scores increased from 60 to 83 on the pretest and posttest following large-scale testing, according to statistics from the tests. The results presented in Table 4 indicate that the use of the researcher-developed 'Kenalin' media improved student learning outcomes in the class IV Cultural Rich Indonesia content.

Table 4. Large-Scale Test Scores

Action	Lowest Score	Highest Score	Average Score
Pretest	40	75	60
Posttest	70	95	83

The normality test used in this research uses the Shapiro-Wilk formula to analyze *pretest* and *posttest*

learning results and it can be seen whether the data is normally distributed or not because n < 50 (Simanjuntak et al., 2023). The results of the normality test using the Shapiro-Wilk formula showed that *the pretest* and *posttest data* were normally distributed with Sig. The *pretest* value is 0.148 ≥ 0.05. Meanwhile, the *posttest* value of the normality test obtained a value of 0.218 ≥ 0.05. Table 4 shows the results of the normality test as follows.

Table 5. Normality Test Results

	Statistics	df	Sig
Pretest	.934	22	.148
Posttest	.942	22	.128

The T-Test computation comes next, following the completion of the normalcy test using the Shapiro-Wilk algorithm. The Sig value can be ascertained using the Paired Sample T-Test findings. Given that the 2-tailed value is 0.000 < 0.005, Ho is disqualified and Ha is approved. According to these findings, there is a noteworthy distinction or impact in how the 'Kenalin' learning media, which is built on Smart Apps Creator, is used to enhance student learning outcomes for the class IV Indonesiaku Rich Culture subject.

Table 6. Paired Sample T-Test

	Mean	Std.Dev iati on	Std. Err or Mean	95% Confidence Interval of the Difference			t	df	Sig. (2-tailed)
				Lower	Upper				
Pretest	23.40	7.92	1.68		Paired Differences				
Postest		620	87						

The computed N-Gain value is 0.12808, indicating that the N-Gain is above 0.7 and hence considered high. This number indicates that using the "Kenalin" learning materials that the

researchers created significantly improves learning results. The following table displays the results of the N-Gain test.

Table 7. N-Gain Test

	N	Minimum	Maximum	Mean	Std. Deviation
			Shapiro-Wilk		
	Statistics		df		Sig
Pretest	.934		22		.148
Postest	.942		22		.218
N-Gain	22	.38	.86	.5830	.12808

Following the extensive testing phase, educators and students were requested to respond to a survey about how they had utilized the "Kenalin" medium. At this point, the questionnaire's results showed that

teachers' responses had an average score of 100% with very feasible criteria, while students' responses had an average response percentage of 98% with extremely viable criteria. The following table displays the

questionnaire's results.

Table 8. Feasibility Questionnaire Results

Response	Maximum Score	Total Score	Score Percentage%	Criteria
Student response	330	325	98	Very worthy
Teacher response	15	15	100	Very worthy

The success of an educator in teaching is not only seen in how the teacher teaches material but many factors support it so that learning can be said to be successful (Melindawati & Alfiyandri, 2023); (Pozas et al., 2023); (Darling-Hammond et al., 2020). One of the supporting factors is the use of learning media. Media in learning are software and hardware, which function as tools (N. Sari & Liansari, 2023); (Schindler et al., 2017). Education in many countries has transformed by continuing to adapt to changes and advances in technology applied in the learning process. This shows that the conventional era is starting to shift to the digital era, and this condition hasa big impact on the world of education (Magistretti et al., 2022); (Purnasari & Sadewo, 2021). Media has an important role in helping students to gain maximum understanding of learning material (Ratnasari & Haryanto, 2019);(Sivakumar et al., 2023);(Tafonao, 2018);(Winda & Dafit, 2021). The use of appropriate media in the learning process will create a pleasant atmosphere so that students become active, creative, and effective, and gain meaningful learning experiences (Haleem et al., 2022); (Smiderle et al., 2020).

In implementing the Natural and Social Science Education (IPAS) learning content, there are still obstacles and problems that occur. Based on the resultsof observations and interviews conducted by researchers in class IV of SD Negeri Kandri 01, the factsof several of these problems were obtained. The first is that teachers generally use conventional learning mediamore often so that students get bored when learning. Second, the use of media such as video displays from YouTube or PowerPoint is still less varied and innovative, so there is a need for innovation in developing learning media so that students can explore their abilities to understand learning material (Dwivedi et al., 2023); (Van Laar et al., 2020); (Wang & Tahir, 2020). Third, the material on Indonesia Rich in Culture is very broad in its discussion because it includes too many sub-chapters regarding culture in Indonesia.

Based on these concerns, researchers created the 'Kenalin' learning media using Smart Apps Creator to improve the learning results of class IV pupils at SD Negeri Kandri 01. Because learning media exist and can improve access to knowledge, using them in the learning process is crucial. wide, enhances the educational process with captivating images and sounds, and permits more engaged engagement between students and the content (Matje, 2022); (Al Mamun & Lawrie, 2023). In addition to inspiring students to study, the usage of learning media in the classroom canalso spark new interests and desires in them(Antari et al., 2023); (Wulandari et al., 2023); (Petersen et al., 2022).

As technology advances, the use of learning media becomes increasingly relevant in supporting an independent curriculum. Smart Apps Creator is one of the applications that have the potential to increase interactivity and learning effectiveness (Khasanah & Rusman, 2021); (Montenegro-Rueda et al., 2023); (Kamalov et al., 2023). According to (Rahma et al., 2024); (Arif Ms, 2023); (Huzaima Mas'ud et al., 2023), he explained that the Smart Apps Creator application is very easy to use in creating learning media, without creating any code, andcan develop mobile applications for iOS and Android to make it easier for students to open it on all platforms, save the application file in HTML5, EXE, and APKformats.

Conclusion

This development research created a learning media 'Kenalin' in the science and science subject, My Indonesia is Rich in Culture in class IV elementary school. This learning media has been assessed by expert validators by carrying out a comprehensive evaluation to assess the suitability of the media being tested and identify existing weaknesses so that they can be corrected. 'Kenalin' media was declared very feasible with an assessment percentage of 95% from media experts and 92.50% frommaterial experts. The results of the large-scale trial showed that the student response to the use of 'Kenalin'media was 98.4% and the teacher response was 100%. The use of the 'Kenalin' learning media was declared effective based on the results of the pretest and post-test score analysis with normality test results having a normal distribution. The results of the pretest and post-test score analysis stated that the t-test obtained a resultof 0.000 <0.005 indicating that there was an influence of the use of 'Kenalin' learning media on increasing the average student score from 60 to 83 or an increase in N-Gain of 0.5830 which included in the medium category. Therefore, it can be concluded that the

'Kenalin' learning media is feasible and effective for improving the learning outcomes of fourth-grade elementary school students in the science and science subject, My Indonesia is Rich in Culture.

Author Contributions
Our role (NM, S) in writing this scientific article, NM as the first author made observations in the schools that were the research locations to identify problems in the learning process. Next, NM proposed the 'Kenalin' application as a solution to the problems found. Then process the research data and write the article. The Supervisor (S) contributed by providing suggestions and ideas for research instruments, as well as guiding, directing, and evaluating the author during the writing process.

Conflicts of Interest
The authors declare no conflict of interest

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