

The Development of Raya-In: Learning Media Based on Smart Apps Creator to Improve Primary School Social Science Learning

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Abstract: Technology-based learning media in social science are not readily available in primary schools. Meanwhile, learning media, especially technology-based, supports social science competencies for primary school students. This study aimed to develop learning media, named Raya-In (Ragam Budaya Indonesia), based on Smart Apps Creator to improve the social science learning of fourth-grade students in SDN Kangkung 01 within the Indonesian cultural diversity theme. This study used the Borg and Gall model design, which consisted of 8 stages: potential and problem analysis, data collection, product design, product validation, revision, small-scale trial, large-scale trial, and final product. The study involved media experts and content experts to validate the media. The subjects were fourth-grade students of SDN Kangkung 1 (n=39). Data was collected by observation, interview, pretest, questionnaire, documentation, and posttest. The final result showed that Raya-In passed the media and content experts' evaluation and revision processes. The media and content experts gave high scores in the qualified category. The Pretest, posttest, T-test, and N-gain tests showed that Raya-In supported social science learning. The study aligned with learning in the current era, using technology-based media. Raya-In development based on Smart Apps Creator was validated to support social science learning in primary school.

Keywords: Raya-In; Smart apps creator; Social science learning media

Introduction

Education is a process carried out consciously to develop a mindset and lead to better behavior. Education has a significant role in preparing and developing human potential (Kamalov et al., 2023). So that it will be able to compete intelligently and skillfully in the global scope later. The development of increasingly sophisticated technology can provide innovation in the world of education, such as learning media that is now becoming more varied and modern. Educators must be literate of technology, which means that it must be able to take advantage of technological sophistication. Learning media is a tool used by teachers

to convey messages in the form of learning materials to students so that learning becomes more effective and efficient (Wijaya et al., 2024). Good learning media will increase teacher interaction with students. Learning media should be able to help teachers in animating the learning atmosphere. With the existence of learning media, the delivery and explanation of material can vary by displaying images, video shows, then there is a collaboration of text, sound, and animation so that learning is not boring. A learning is said to be meaningful if everything is student-centered, meaning that students must also be actively involved in learning (Azmi et al., 2024).

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One of the innovative learning media that has utilized technology is digital interactive learning media based on Smart Apps Creator software or often abbreviated as SAC. Smart Apps Creator is a tool that can create a mobile multimedia application. Creating applications using Smart Apps Creator is quite simple and easy because it can be done without coding. The resulting application can be accessed through devices that use the Android operating system. Smart Apps Creator has several advantages (Agustina et al., 2024), including being able to create applications easily without coding or programming processes, the application file size is small, so it does not burden RAM storage space devices, the appearance is simple, and the tools are easy to understand, the product can be accessed via smartphones, laptops, computers, tablets, and can be used offline or without an internet network. While the disadvantages of Smart Apps Creator are that it is a trial so that if the trial period expires it cannot be used, the available features are also limited because the system does not require coding, there is no exit feature so that if the user wants to exit the application, they can directly press the back button on the device used.

An education can be said to be successful if the learning outcomes meet the standards. Based on Government Regulation No. 19 of 2005 Article 63 Paragraph 1, assessment of student learning outcomes at the primary and secondary education levels consists of assessment of learning outcomes by educators, education units, and the government. Assessment of learning outcomes includes 3 aspects (Fanani et al., 2024), namely cognitive aspects, affective aspects, and psychomotor aspects. Learning outcomes are the end result of a learning activity that is used to measure the level of learning success. Indonesian education has changed its curriculum several times. This school year, education in Indonesia uses the Merdeka curriculum (Adiyanto et al., 2024). This is of course there are many differences from the previous curriculum. One of the striking differences is that there are IPAS subjects in the Merdeka curriculum. IPAS subjects are a combination of science and social studies subjects. In the Merdeka Curriculum, science and social studies subjects are combined into one, namely under the name IPAS (Azizah et al., 2024).

The creation of IPAS Subjects is because according to the Ministry of Education and Culture, the age of elementary school children still sees everything as a whole, and their mindset is still concrete, that is, they still think simply and cannot think abstractly (Skjæveland, 2017). With the combination of the two subjects, the material contained is also increasingly diverse. Therefore, learning requires learning media, to streamline learning. The results of observations that have been made by researchers show that when learning

IPAS at SDN Kangkung 01, students find learning boring. This is because learning activities are monotonous, teachers do not use interesting learning media. From the results of the researcher's interview with the teacher stated that teachers still often use conventional methods in learning, such as lectures. Lack of teacher creativity, so the learning media used is still simple, and the teaching materials used are also limited. These problems resulted in IPAS learning outcomes not reaching KKM.

The research that showed the success of Smart Apps Creator was a research conducted by Arnandi et al. with title Mathematics "Learning Media Using Smart Apps Creator on Integer Material in Elementary Schools (2022)". In the feasibility test, the learning media obtained a decent category with a good interpretation. The results of students' responses after using this media were also positive. The results of the study received a high score from the validators, which obtained an average of 95.55% in the very valid category. While the average value of practicality gets 93.89%, in the very practical category. As well as getting good responses from students. So, it can be concluded that the learning media developed using Smart Apps Creator is feasible to be applied in learning. The results of the study received a high score from the validators, which obtained an average of 95.55% in the very valid category. While the average value of practicality gets 93.89%, in the very practical category. As well as getting good responses from students. So it can be concluded that the learning media developed using Smart Apps Creator is feasible to be applied in learning.

From the explanation above, it can be seen that previous research that utilizes Smart Apps Creator to create a learning media gets a positive response and can prove the feasibility to be used in learning (Silitonga et al., 2024). Therefore, researchers want to provide learning solutions with the development of interactive digital learning media based on Smart Apps Creator. The novelty of this research is that in the Raya-In application media there are learning videos of examples of actualization of cultural diversity in the research area. With this digital-based innovative idea, it will increase the enthusiasm for elementary school students in capturing and understanding the knowledge presented by the teaching teachers (Ardiansyah & Wicaksono, 2022). The final result of the learning media is an application that can be accessed via an android phone. Through this media, researchers hope to create a new learning atmosphere, so that students do not feel bored, and can improve the learning outcomes of IPAS in grade 4 students of SDN Kangkung 01 Demak Regency.

Method

This research used the Research and Development (RnD) research type. RnD research can also be called Development Research, which is developing a product, that will later be validated, tested for feasibility, and effectiveness in the resulting product (Fahlevi & Aminatun, 2023). This research aimed to develop an interactive digital learning media based on Smart Apps Creator, and improve the learning outcomes of IPAS subjects on the material of Indonesian Cultural diversity in grade 4. The stages carried out by researchers in developing interactive digital learning media based on Smart Apps Creator refer to the design of the Borg and Gall model which has 10 stages (Aulia et al., 2024), but researcher only used 8 stages, namely analyzing potential and problems, collecting data, designing products, validating products, making improvements or revisions, small-scale trials and large-scale tests to produce final product. The research location was at SDN Kangkung 01 Demak. The test subjects in this study were fourth grade students of SDN Kangkung 01, totaling 39 children. The research subjects consisted of learning content expert, learning media experts. Then the data collection technique was carried out by interview, questionnaire, documentation, and assessment. The data collection instrument used is a rat-ing scale. The instrument grids are presented in Table 1 and Table 2.

Table 1. Content Expert Instrument Indicators

Aspect	Indicator
Curriculum	Appropriateness of Learning Outcomes (learning outcomes)
	Appropriateness of Learning Objectives
	Appropriateness of Learning material
	Completeness of Material
Language	Language Appropriateness
	Appropriateness to learner development
	Appropriateness to the level of difficulty
Materials	Clarity of material description
	Knowledge
	Appropriateness of video content to the material
Elements	Suitability of evaluation questions with the material
	Images are in line with the material
	The picture clarifies the material
Images help understand the material	

Modification of Khoirudin et al. (2021)

The data analysis technique in this research was descriptive qualitative analysis, and quantitative or mix methods. Qualitative data analysis is used to collect data in the form of responses from experts, teachers, and students. While quantitative analysis is used to collect data in the form of scores from experts, calculating product effectiveness tests. This research uses a method

to analyze the results of pretest and posttest to determine the effectiveness of the products developed (Hamidi et al., 2024). However, previously a test instrument test was carried out to determine whether the data was valid or invalid. Then there is a t-test to determine the difference from the results before and after using the product. The N-gain test was also carried out as a confirmation of the results of increasing learning outcomes from the difference between the maximum pretest and posttest scores.

Table 2. Media Expert Instrument Indicators

Aspect	Indicator
Media effectiveness	Appropriateness of Learning Objectives
	Effectiveness of media use
	Efficiency of media use
	Presence of instructions for use
Design quality	The navigator icon is easy to understand
	Background color composition
	Selection of sound effects
	Application display design
Appropriateness of elements	Letter font selection
	Font size
	Font color selection
	Suitability of elements in the media
Practicality of use	The developed media is right on target
	Learning media can be operated easily
	Media is communicative

Modification of Khoirudin et al. (2021)

Result and Discussion

Result

This research produces interactive media in the form of a Raya-In application containing IPAS material on Cultural Diversity in Indonesia for grade 4. This research used a research model from Borg and Gall which has 10 steps, but here the researcher only used 8 steps, namely analysis of potential and problems, data collection, product design, product validation, revision, small-scale trial, large-scale trial, and final productsection is often appropriate. Avoid extensive citations and discussion of published literature.

First, analyze the potential and problems. The research was conducted at SDN Kangkung 01, Demak Regency, in the 2023/2024 academic year in grade 4. The number of students was 39, with 19 male students and 20 female students. The author conducted field observations to obtain information that served as problem identification in the study. A needs analysis was obtained through initial observations, namely interviews with grade 4 teacher of SDN Kangkung 01, Demak Regency. The results of the interview were used as a foundation for determining problem identification

in research and development of interactive digital learning media based on Smart Apps Creator. Based on the analysis of potential and problems obtained from 39 students, 19 students (42.8%) have not met the KKM and 20 students (57.2%) have met the KKM, for the KKM is 70. This is because students are less interested in learning and feel bored. Learning with conventional methods, and the lack of use of learning media are the main causes of students' boredom in learning. So that it resulted in low learning outcomes.

Furthermore, the second step, data collection that will be used in the research and development of interactive digital learning media based on Smart Apps Creator, namely observation of learning activities and school conditions, interviews with grade 4 teacher of SDN Kangkung 01 Demak Regency, analyzing learning media needs through researcher observations, and collecting material on Indonesian Cultural Diversity. From the results of the data that has been collected, it can be seen that out of 39 students, 19 students have not reached the KKM. This is due to boring learning, teachers have not used digital learning media, and the inappropriateness of learning media, so students feel less enthusiastic and less active in learning. After all the necessary data has been obtained, the researcher begins to think about the concept and design of the learning

media to be developed. Researchers also analyzed learning outcomes and outlined material achievement indicators. The following results of the analysis of learning outcomes and descriptions of material achievement indicators are presented in Table 3.

Table 3. Analysis of Learning Outcomes and Indicators Achievement

Learning Outcomes	Indicator of Achievement
Learners recognize cultural diversity, local wisdom, History (both figures and periodization) in the province where they live, and relate it to the context of current life.	Identify the various cultural diversity in Indonesia. Analyze the factors that cause cultural diversity in Indonesia. Apply a tolerant attitude towards cultural diversity in Indonesia.

In product design activities, researchers start by planning the product and then making the initial product. This product design also considers the results of the learning media needs questionnaire filled out by students and grade 4 teachers. Planning activities include activities to compile menus on learning media, as well as content plans for the beginning, content, and closing sections in the media.

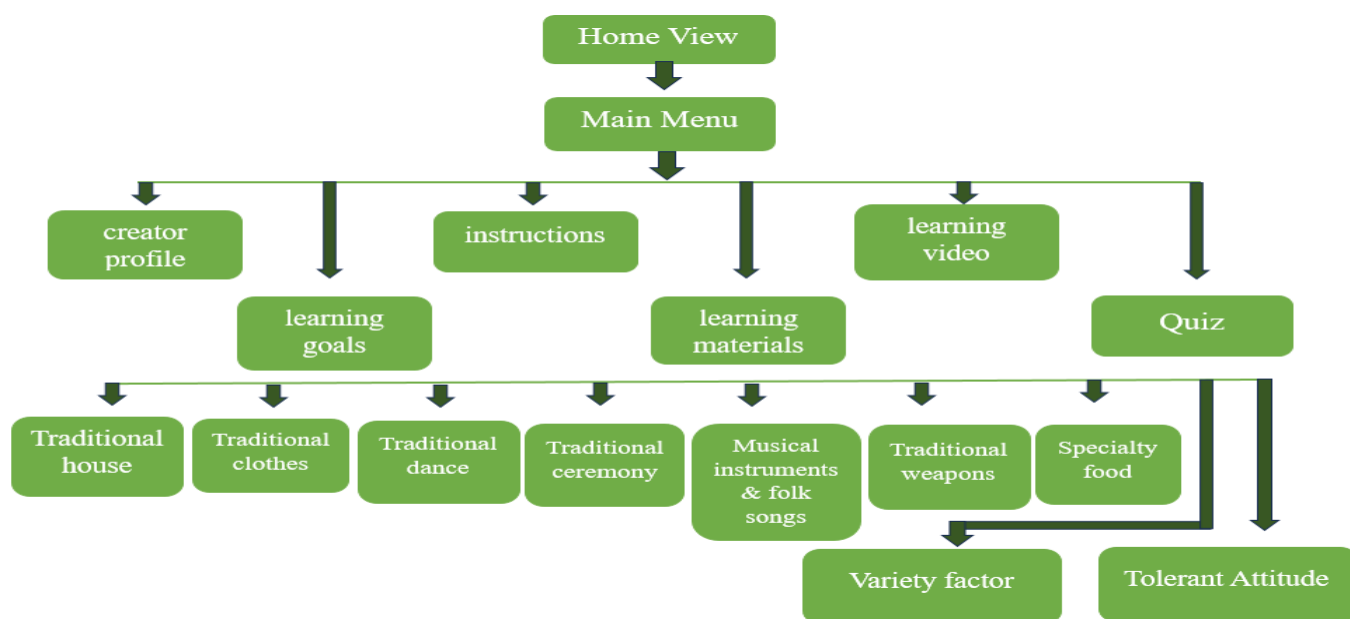


Figure 1. Storyboard of learning media

In Figure 1, slides that are connected with a green arrow mean that they are interconnected, or if clicked, it will direct to the connected slide. The output of this interactive digital learning media product is in the form of media in the form of applications and is used with Android phones. Then the learning media that has been designed and made by researchers must go through the

validation stage. Design validation is an activity to assess the initial product that has been made so that it can be seen to what extent the product is suitable for research. Validation was carried out by two experts, namely content experts and media experts. Product assessment using a questionnaire with a score range of 1

to 5. The formula that researcher used to test media feasibility is as follows.

$$NP = \frac{R}{SM} \times 100\% \tag{1}$$

The following are the results of the product assessment from the experts.

Table 4. Result of Media Expert and Content Expert Validation Scores

Instrument			
Aspects	Score	Percent (%)	Category
Media	67	89	Very Feasible
Effectiveness of Media			
Design quality			
Element suitability			
Practicality of use			
Material	65	93	Very Feasible
Curriculum			
Language			
Materials			
Elements			

Based on Table 4, shows that the validation results from experts, both media expert and content expert, state that the product is very suitable for use. However, there are several inputs to improve the product, both from media experts and content expert. The media validator provided input to replace or edit the font color to make it look clearer, and add a total score at the end of the quiz. While the material validator provides input so that the learning video is an example of actualization of diversity at the research site and the video must be original made by the researcher. Design revision is to reduce deficiencies in the initial design of the product by improving the product. Design revisions are considered based on the results of product validation by material and media experts. The following is the display before and after revision.

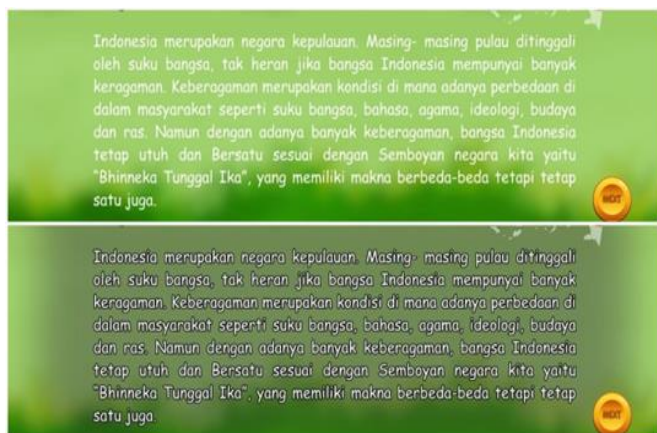


Figure 2. Before-after revision view

In the previous design, the font color was white, but received feedback from the media validator to change the font color to make it look clearer. So, the researcher gave a black outline to the font, to make it look clearer, and more legible.



Figure 3. After revision display

The previous design did not have a total score slide at the end of the quiz. After getting input from media experts, researchers added a total score slide to find out the final score obtained by students after taking the quiz. Then after getting input from the material expert, the researcher changed the learning video, which was originally a diversity video from YouTube to a video edited by the researcher himself regarding real examples or actualization of diversity in the research location, namely in Demak district. The revised results received good responses from the validators, and were allowed for the next stage.

The next stage is the small group trial. Researchers tested interactive digital learning media products based on Smart Apps Creator to nine grade 4 students of SDN Kangkung 01 Demak Regency. The sample selection was based on the purposive sampling technique which is a sample selection technique based on certain considerations (Siregar et al., 2022). With this consideration, the study involved 9 students, with the categories of 3 students with the highest average score, 3 students with medium average scores, and 3 students with low average scores, out of 39 students in class IV SDN Kangkung 01 Demak Regency. Testing is done with pretest and posttest. The following are the results of the small group pretest and posttest.

Table 5. Small Group Pretest and Posttest Result

Type of Test	Average	Difference in Average
Pretest	59	
Posttest	86	27

Next is the large-scale trial stage, which is carried out with 30 students. The test is also the same as the small group, namely using a pretest and posttest. Then

the teacher and students fill out a response questionnaire after using the product. The following are the results of the large group pretest and posttest.

Table 6. Large Group Pretest and Posttest Result

Type of Test	Average	Difference in Average
Pretest	62.40	23.90
Posttest	86.30	

From the results of the pretest and posttest of the large-scale trial, the t-test was conducted to determine the effectiveness of interactive digital learning media based on Smart Apps Creator on student learning outcomes.

Table 7. The Result of T-test

Paired Difference	Sig. (2-Tailed)
Posttest	
Pretest	

Based on the calculation results, the t_{count} value is 16.92. The value of $df = 29$ and the significance level $\alpha = 0.05$ obtained the value of $t_{table} = 1.69$. So, it can be concluded that the value of $t_{count} > t_{table}$, $16.92 > 1.69$, then the hypothesis can be accepted. So, that there is an average difference between the pretest and posttest scores after using the learning media Raya-In based on Smart Apps Creator in the form of an application. In addition, seen from the results of the N-gain test, the average value is 0.71, which means it is in the high category. Then the frequency that can be seen from the N-gain test is that there are 10 students in the high category, 20 students in the medium category, and 0 students in the low category. So, the conclusion from these results is that the treatment given is effective in improving IPAS learning outcomes. The results of the analysis can be concluded that there is a significant difference between the pretest and posttest results.

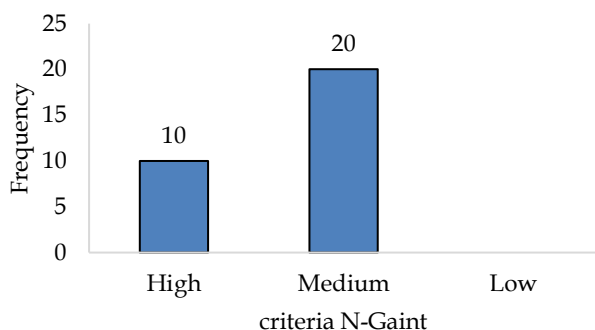


Figure 4. Chart of n-gain test result

The final product of Smart Apps Creator-based learning media is an application. This application is called Raya-In which can be accessed via Android

phones offline. It includes a developer profile menu, learning objectives and outcomes, instructions for use, materials, learning videos, and practice questions. This application also has a music feature that adds to the attractiveness for students. From the students' responses, we can conclude that the design of each slide is interesting, and the navigation symbols are also easy to understand. The use of this application through mobile phones also adds to the attractiveness of students (Meisarah & Suparno, 2024). Student's usually only play games on their cellphones, but with the Raya-In application, students can also learn. The role of this application is the same as an educational application (Ningsih et al., 2024). This application consists of interconnected slides, the following is the appearance of the final product.



Figure 5. Product results

On the initial display, if the start button is pressed, the main page will appear. This page contains the developer profile menu, learning objectives and learning outcomes, instructions for use, materials, learning videos, and practice questions. The developer profile page contains information on the Raya-In application developer, such as the developer's name, study program, agency origin, and the name of the supervisor. The instructions for use page contains instructions for using the application in the form of functions of the buttons that can be used in this application. The learning objectives and learning outcomes page contains the learning objectives to be achieved, and the learning outcomes of the IPAS subject matter on the diversity of Indonesian culture. Then on the material page an explanation of the subject matter is presented, then there is a choice of material, and if clicked it will lead to the contents of the selected material. The learning video page contains learning videos about examples of the actualization of diversity in the research location. The display is in Figure 4.

Then the practice problem page contains practice questions in the form of multiple choice, which amounted to 10 questions, with a maximum score of 100. If you answer correctly, you will get a score of 10 and if you answer incorrectly, you will get a score of 0. At the end of the practice problem slide, there is the number of scores obtained, in Figure 3. In the Raya-In application there is also a guidebook to guide students in getting the Raya-In application, namely by downloading and installing it. The Guidebook has 4 pages containing the front cover, a QR code to scan the application, then the requirements for devices that can be used, and how to download the application and install it on an android cellphone. The following is a guidebook for downloading and installing the Raya-In application. Here's what the how the guidebook looks like.



Figure 6. Guidebook

Discussion

Based on the results of data analysis, it shows that Raya-In media is suitable for use in learning IPAS. This is evidenced by several factors, including that using Raya-In media can improve the learning outcomes of IPAS of grade 4 students of SDN Kangkung 01 Demak Regency. Learning media is the main supporting tool for learning (Marpanaji et al., 2018). The use of learning media makes it very easy for teachers to convey information and explain material (Sarin et al., 2021). Likewise, students also easier to understand the explanation of the material (Suryadi et al., 2020). Then in the current era of learning, teachers should utilize the sophistication of technology (Rambe et al., 2022). So one of the efforts to use technology in learning is the use of technology-based learning media (Puspitasari et al., 2022). With the creation of interactive digital media Raya-In based on Smart Apps Creator in learning can overcome problems in learning that are still conventional. Previous research on learning media also stated that the use of learning media lightens the burden on teachers, one of which facilitates the explanation of

material that is abstract or difficult for students to imagine (Dewi et al., 2022).

Previous research also emphasized one of the functions of learning media, namely to liven up the learning atmosphere, so that students are more focused and interested in listening to learning (Mahuda et al., 2021). It can be concluded that learning media brings many advantages to learning, namely making it easier for teachers to explain material, making it easier for students to capture material, and livening up the learning atmosphere, so that students become interested. Therefore, the use of learning media can improve learning outcomes. Second, Raya-In media can increase student learning motivation. The grade 4 students of SDN Kangkung 01 Demak who became the research trial subjects gave a good response to the use of Raya-In Media as a learning media. This was obtained from the results of the response questionnaire after using the media. The use of Raya-In as a media can create new experiences for students, because previously students have never learned to use applications like this which can be accessed with an android cellphone. This is in line with the level of enthusiasm of students during learning, which is seen from the activeness of students in working on evaluation questions. In addition, Raya-In media also provides images, audio, and video so that students are not bored reading and understanding the material.

Mayanda et al. (2024) stated that students tend to like learning media that contains audio-visuals because it can increase students' enthusiasm for learning and tends not to be boring. The use of digital learning media should be applied to learning in the current era, because it can improve students' skills (Fathoni et al., 2021). The use of interactive digital learning media can increase situational interest, learning motivation, and create a positive learning environment (Putera et al., 2020). Raya-In media is developed with an attractive design, and is equipped with images and sound effects that support students to focus on learning the material. The use of Raya-In media based on Android mobile phones motivates students, that learning can also be through mobile phones not only in books, thus motivating that learning can be obtained from anywhere and done at any time (Wang et al., 2023).

Third, Raya-In media is worth using in learning because it can create a new atmosphere in learning, especially IPAS learning material on Indonesian cultural diversity. Usually in learning, especially IPAS learning, teachers only use books or power points in delivering material. The use of Android-based Raya-In media is a new experience for grade 4 students of SDN Kangkung 01 Demak Regency learning to use mobile phones. This makes students more active in learning and creates a fun learning atmosphere. Learning using Android is an implementation of innovative learning (Manurung &

Panggabean, 2020). Other research states that learning using digital media has a flexible learning time, because it can be accessed anywhere and anytime (Oktarina et al., 2021). Raya-In digital media is equipped with interactive features, namely images of cultural diversity, videos, and educational games. Combining images, videos, and games in a medium can arouse students' enthusiasm, making it easier to understand the material explained by the teacher (Amelia & Harahap, 2021). Students' enthusiasm for learning is characterized by being active in responding to questions, and enthusiastically listening to learning. This can liven up the learning atmosphere in the classroom (Shofi, 2020).

Previous relevant research states that learning using interactive digital media can increase the enthusiasm of students (Widiastika et al., 2020), with the impact of improving students' cognitive abilities (Alamiyah et al., 2021). Other findings also argue that the use of in-active digital media is suitable for current learning, teachers must be creative to keep up with the times, and introduce it to students (Fauzi et al., 2021). Other research states that the use of Smart Apps Creator to create a learning media can increase learning motivation in students so that learning outcomes are also high (Djimadi et al., 2023). The findings also confirm that learning media based on smart apps creator can increase teacher creativity so that teachers are more trained in creating a pleasant learning atmosphere (Kayal et al., 2022). So, it can be concluded that the use of smart apps creator in learning media development has a positive impact on learning. Because it is equipped with interactive features, and provides free space for teachers to be creative, thus creating innovative and interesting learning media (Haleem et al., 2022). This is can provide new experiences for students, increase learning motivation, and improve learning outcomes (Syadida, 2022).

Conclusion

The results showed that Raya-In media is effective in improving the learning outcomes of IPAS of grade 4 students of SDN Kangkung 01. This is evidenced by the significant difference between the pretest and posttest results. Where the posttest results are higher than the pretest results. The t-test results with a value of $df = 29$, a significance level of $\alpha = 0.05$, and a t-table value = 1.69 are obtained. Then after the t-test calculation is obtained $t_{count} > t_{table}$, $16.92 > 1.69$, the hypothesis can be accepted. The development design of this Smart Apps Creator-based Raya-In learning media product has also been tested and validated by experts. The validation results show that this product is suitable for use. The responses from teachers and students of class IV SDN Kangkung are also very positive which can be shown based on the

results of the questionnaire. So, it can be concluded that learning media in the form of Raya-In applications can improve the learning outcomes of IPAS grade 4 students of SDN Kangkung 01, Demak Regency, it is recommended that educators should start to be literate in technology, by using technology-based learning media, so that learning is also more interesting and gives a new impression to students. That way students will be more enthusiastic in learning and minimize boredom when learning takes place; the school must support technology-based learning, by providing and completing facilities. Then hold training for teachers about making technology-based learning media; it is necessary to develop more Smart Apps Creator-based learning media using Android phones with different materials, or other subjects.

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Author Contributions

Conceptualization; N. H., P. K. M: methodology; N. H., validation; P. K. M.: formal analysis.; N. H.: investigation.; P. K. M; resources; N. H: data curation: P. K. M.: writing – original; N. H: draft preparation; P. K. M: writing – review and editing: N. H; visualization: P. K. M. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

No conflicts of interest.

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