Development of Science Learning Media Klanimal Android-Based for Elementary School Students

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Abstract: The difficulties students face in understanding the concepts of Science are due to their abstract nature, making it difficult to retain long-term memory. The research objective is to develop an interactive Android-based media to visualize Science learning, specifically the concept of animal classification based on their types of food, to facilitate its retention in students' long-term memory. The "Klanimal" media is an Android-based platform that includes content menus, learning objectives menus, animal guessing menus, and quiz menus. The research methodology employed in this study is the Research and Development (R&D) approach. The development model used is the ADDIE development model, which consists of the Analysis, Design, Development, Implementation, and Evaluation stages. Media experts and subject matter experts validated the Klanimal media. Subsequently, it was tested on 6th-grade students. The test results showed a percentage of 89.8, indicating a highly suitable category. Pretest and post-test scores improved, and the N Gain analysis indicated a value of 0.70, indicating a significant increase in understanding. The research findings suggest that the effective use of Android-based Science learning media enhances the understanding of 5th-grade students at SDN Candibinangun IV Sukorejo, specifically regarding the topic of animal classification based on their types of food.

Abstrak: Kesulitan siswa dalam memahami konsep IPA adalah konsepnya yang bersifat abtrak sehingga tidak melekat pada memori jangka panjang siswa. Tujuan penelitian adalah mengembangkan media interaktif berbasis android untuk memvisualisasikan pembelajaran IPA sehingga konsep klasifikasi hewan berdasarkan jenis makanannya dapat melekat dalam memori jangka panjang siswa. Media klanimal adalah media berbasis andoid yang berisi menu materi, menu KI/KD, menu tebak hewan dan menu quiz. Metode penelitian ini menggunakan metode RnD (Research and Development). Model pengembangan yang digunakan yaitu model pengembangan ADDIE yaitu Analysis (Analisis), Design (Desain/Perancangan), Development (Pengembangan), Implementation (Penerapan), dan Evaluation (Evaluasi). Media klanimal divalidasikan oleh ahli media dan ahli materi. Kemudian dilakukan uji coba pada siswa kelas 6. Hasil uji coba menunjukkan persentase 89,8 yang termasuk dalam kategori sangat layak. Setelah dilakukan uji pretest dan posttest menunjukkan adanya peningkatan skor. Setelah dilakukan analisis menggunakan N Gain maka dapat ditentukan uji N Gain menunjukkan nilai 0.70 yang berarti terjadi peningkatan pemahaman yang signifikan. Hasil penelitian menunjukkan bahwa penggunaan media pembelajaran IPA berbasis Android secara efektif meningkatkan pemahaman siswa kelas 5 SDN Candibinangun IV Sukorejo terkait materi klasifikasi hewan berdasarkan jenis makanannya.

A. Introduction

Science learning contains knowledge about facts, concepts, or principles and the discovery process of the natural environment (Handayani & Jumadi, 2021). Based on the Regulation of the Minister of National Education Number 22 of 2006 concerning Content Standards for Elementary and Secondary Education Units, it is stated that Science is one of the compulsory subjects at the Elementary School level to Junior High School level. Science is an important subject for the growth and development of elementary school students. Science teaches attitudes and scientific thinking skills to understand the natural environment around students. The benefit of learning Science is that students can develop skills in all activities in learning Science. Science learning also has benefits such as being able to increase students' understanding of what is around them, being able to think logically and systematically, and being able to solve problems experienced.

The basic nature of science learning is abstract and only presents information so that students easily forget (Wicaksono et al., 2020). The problem in learning science is that it is difficult for students to understand science concepts because some material is theoretical and cannot be presented directly in classroom learning. Students learn science concepts using books and pictures that do not provide meaningful experiences. Students must remember learning outcomes for a short time. The weakness of students' long-term memory is caused by learning only activating the left brain to remember information (Musbaing, 2021). The left brain has the ability for short-term memory but cannot be used for long-term memory abilities. The right brain can store long-term memory, but it is not optimal for learning in class because the learning method is only memorizing and listening. In addition, student participation in Science in class still needs to improve due to a lack of motivation and one-way nature from teacher to student. Learning media used in schools could be more effective in improving learning outcomes, namely, only using books (Fadhli, 2015).

Problems in learning science material were observed in several elementary schools in the Pasuruan area through observations and teacher interviews. At school A, learning activities in grade 5 only used textbook media. Different from school B, the result was that the science learning process could have been more meaningful. Students need repetition of explanations from the teacher so they can remember the material presented. Then, at School C, grade 5 students needed to understand the concept of classification better because students were not enthusiastic about participating in class learning. Then, at School D, the obstacle students experienced was the teacher's speed when explaining that they could not follow because they only used blackboard media in front of the class. So it was concluded that the problems in several elementary schools in the Pasuruan district were: 1) The science learning process was less meaningful and could not be embedded in students' long-term memory, 2) In the learning process, students did not understand the concept of classification properly because science material was abstract, 3) Class 5 learning activities use thematic package book media so that science material is not optimal, 4) Grade 5 students learn animal classification material by memorizing the information contained in thematic package books so that it is only stored in short-term memory. Under these conditions, learning media that

can improve students' understanding of science learning is necessary. Learning media is integral to classroom learning, especially for elementary school students. Learning media has a strategic role in providing facilities for achieving learning objectives Problems in learning science material were observed from several elementary schools in the Pasuruan area through observations and interviews with teachers. At school A, learning activities in grade 5 only used textbook media. Different from school B, the result was that the science learning process could have been more meaningful. Students need repetition of explanations from the teacher so they can remember the material presented. Then, at School C, grade 5 students needed to understand the concept of classification better because students were not enthusiastic about participating in class learning. Then, at School D, the obstacle students experienced was the teacher's speed when explaining that they could not follow because they only used blackboard media in front of the class. So it was concluded that the problems in several elementary schools in the Pasuruan district were: 1) The science learning process was less meaningful and could not be embedded in students' long-term memory, 2) In the learning process, students did not understand the concept of classification properly because science material was abstract, 3) Class 5 learning activities use thematic package book media so that science material is not optimal, 4) Grade 5 students learn animal classification material by memorizing the information contained in thematic package books so that it is only stored in short-term memory.

The phenomena gap in this study is the limited availability of interactive learning media specifically designed for elementary school students at SDN Candibinangun IV Sukorejo. The learning process always uses printed media in textbooks and student worksheets, resulting in gaps in students' ability to absorb information. Some students use auditory abilities, but others are more inclined to use visual abilities. This gap causes a small number of students who can absorb information optimally and store it in long-term memory. Therefore, interactive learning media must be studied to improve students' ability to absorb information according to their abilities.

According to the Atkinson-Shiffrin model, information is first received by sensory memory. Information given to students during science learning is received in visual or auditory form (Marx & Gilon, 2022). However, sensory memory is limited, so information not taken seriously needs to be remembered. If students do not pay sufficient attention to science material presented in the abstract form, then the information will not reach the short-term memory stage. However, if the information is considered seriously, then the information will be transferred to short-term memory. Because short-term memory is limited, students need help retaining abstract scientific information in their brains. This can be caused by too much information that must be stored quickly or a need for proper reinforcement of the material (Pratiwi et al., 2022).

Furthermore, long-term memory is the long-term storage area for relevant information (Baddeley et al., 2019). However, students need to engage in deep and appropriate reinforcement to retain information in long-term memory. When science material is abstract, such as complex scientific concepts, students face difficulties in

converting it into a strong memory and connecting with existing knowledge in their long-term memory. Under these conditions, learning media that can improve students' understanding of science learning is necessary. Learning media is integral to classroom learning, especially for elementary school students. Learning media has a strategic role in providing facilities for achieving learning objectives (Husniyah, 2022).

Learning media can improve students' scientific thinking skills and create an interesting and fun learning atmosphere. This is in line with (Gayatri & Gaffar, 2023) research, which shows that serial picture learning media can improve students' ability to write recount texts, create a fun learning atmosphere, and increase students' interest in writing. Then (Habib et al., 2023) research shows that learning media can also improve scientific thinking skills for elementary school students. In addition, according to (Shofiyyah & Qohar 2022) research using instructional video media, there was an increase in student learning outcomes so that they achieved the Minimum Completeness Criteria. Learning media can also be universal at all levels of education, starting from Early Childhood Education, Elementary Schools, to High Schools, according to (Apriani, 2023) research results that use the Learning House media.

One of the learning media that can increase students' understanding is by using information technology. The development of information technology affects the use of learning media at all levels of education. With the development of technology, learning media is no longer limited to print media such as books and pictures provided by schools (Rahayu et al., 2022). The importance of applying information technology in developing learning media is to improve the quality of the learning process using print media. In line with research (Huda, 2020), which shows that applying information technology can improve the quality of the learning process.

Applying appropriate information technology learning media from various alternatives uses interactive learning media. Interactive learning media is the development of printed learning media by applying information and communication technology. Interactive learning media can interact with students because it involves active responses during the learning process (Rihani et al., 2022). The use of interactive learning media has increased due to the rapid development of information technology. Interactive learning media can improve students' learning experiences and influence learning outcomes (Myori et al., 2019). In addition, interactive media can increase student participation in classroom learning (Candrawati et al., 2022). Research (Novanto et al., 2022) Click here to enter text. Shows the same results, namely increased student participation after using interactive media.

The use of interactive learning media applies to the Android platform. Android-based interactive learning media has been widely circulated but still needs to be improved in its application in elementary schools (Nurhamidah et al., 2022). The reason for using Android-based interactive learning media is the ease of access using smartphones owned by students or their families. The display of interactive learning media on smartphones can combine images, text, audio, and animation, which interests students. Interactive media can

be used easily because the application design is designed intuitively. In addition, research results (Fitriani & Negara, 2021) explained that using this interactive media can increase the enthusiasm and motivation of students to learn Science.

The development of mobile learning media (Fitriani & Negara, 2021) developed media with the title Development of Online Science Learning Applications in the Subject of Human Movement Organs, which is a very suitable qualification for use, but there are drawbacks. Namely, some songs are very disturbing. Other studies also developed Android-based interactive media, which has very good qualifications and is suitable for classroom learning media (Cahyawati et al., 2021; Fitriani & Negara, 2021). The difference between this research and previous research is adding animal guessing games which are useful for increasing enthusiasm for learning, helping students remember material that has been studied before, and adding features that can turn on and off the audio.

The research gap in this study lies in need for Android-based interactive learning media specifically developed for grade 5 students, focusing on the material of animal classification based on the type of food. While previous studies have developed online science learning applications and Android-based interactive media, they need to directly address the specific needs and context of grade 5 students in the mentioned lesson. This research aims to bridge this gap by developing the Klanimal Android-based learning media, specifically targeting the animal classification topic and incorporating features to enhance learning engagement.

The novelty of this research lies in developing the Klanimal Android-based learning media, designed specifically for grade 5 students, focusing on the material of animal classification based on the type of food. Using interactive elements such as images, text, audio, quizzes, and games adds an engaging and immersive learning experience for students. Additionally, adding features that allow the audio to be turned on or off provides flexibility for individual learning preferences. The research aims to improve students' ability to name, understand, compare, categorize, and classify animals, specifically in the context of their type of food. By addressing the school's specific needs and incorporating interactive elements, this research enhances science learning outcomes and engagement in grade 5 students in the targeted topic.

Using Klanimal media solves the problems encountered in Science learning for elementary school students because Klanimal media can provide meaningful learning embedded in long-term memory. Students memorize the concept of animal classification and interact with applications for guessing pictures and quizzes. Research conducted (Adrian & Apriyanti, 2019) states that using technology-based educational games can simplify and understand learning. Students can better remember the classification of animals by using features in Klanimal media. Thus, this study aims to improve students' ability to name, understand, compare, categorize, and classify animals based on their food type. Based on the background above, the researcher submitted a research proposal entitled Development of Science Learning Media Klanimal Android-Based for Elementary School Students.

B. Method

The method used in this study uses the R&D (Research and Development) method. The R&D method is a method that develops or produces a product and tests the effectiveness of the product (Sugiyono, 2021). This learning media development research aims to produce a product that is effective and adapted to current educational needs (Zahwa & Syafi'i, 2022). This study developed an android-based learning media with animal classification material based on the type of food.

This research model uses the ADDIE type of development. The ADDIE development model can be a reference in creating learning tools and infrastructure that are effective, dynamic, and good at achieving learning objectives (Ula & Fadila, 2018). The ADDIE development model is a model that is arranged systematically and has 5 stages, namely, Analysis, Design, Development, Implementation, and Evaluation (Cahyadi, 2019). The stages of developing this media are explained through a flowchart in Figure 1.

In the analysis phase, the researcher analyzed the needs, the student's character, and the material. A needs analysis was conducted by finding information about the problems experienced during the science learning process by conducting observations and unstructured interviews with grade 5 teachers in several elementary schools in the Pasuruan district. The media needs to be needed to solve the problem. Furthermore, researchers analyzed the characteristics of students during class learning activities. Analysis of student characteristics to determine the type of age and socio-economic environment of students. The age of students will determine the stage of their development and the choice of language that is easy to understand; then, the socio-economic environment will determine the type of media that can be chosen for the development of science learning. The selected media type is Android-based media. Finally, the material analysis is adjusted to indicators based on interview results and a study of the 2013 curriculum that applies to elementary schools in the Pasuruan district. The material to be used in this study is science material on the Classification of Animals based on the type of food for class V which is in the Basic Competency section 3.5, Theme 5 Ecosystem, Sub-theme 1 (Ecosystem Component), Learning two. The second stage, namely the design stage (design), is the stage for making a media design with a storyboard that will be developed. At this stage, the researcher prepares pictures and audio according to the material for classifying animals based on their food type. Researchers also designed navigation buttons on learning media to make it easier for users to operate it. The next design is to design the "tebak hewan" feature and design a test layout.
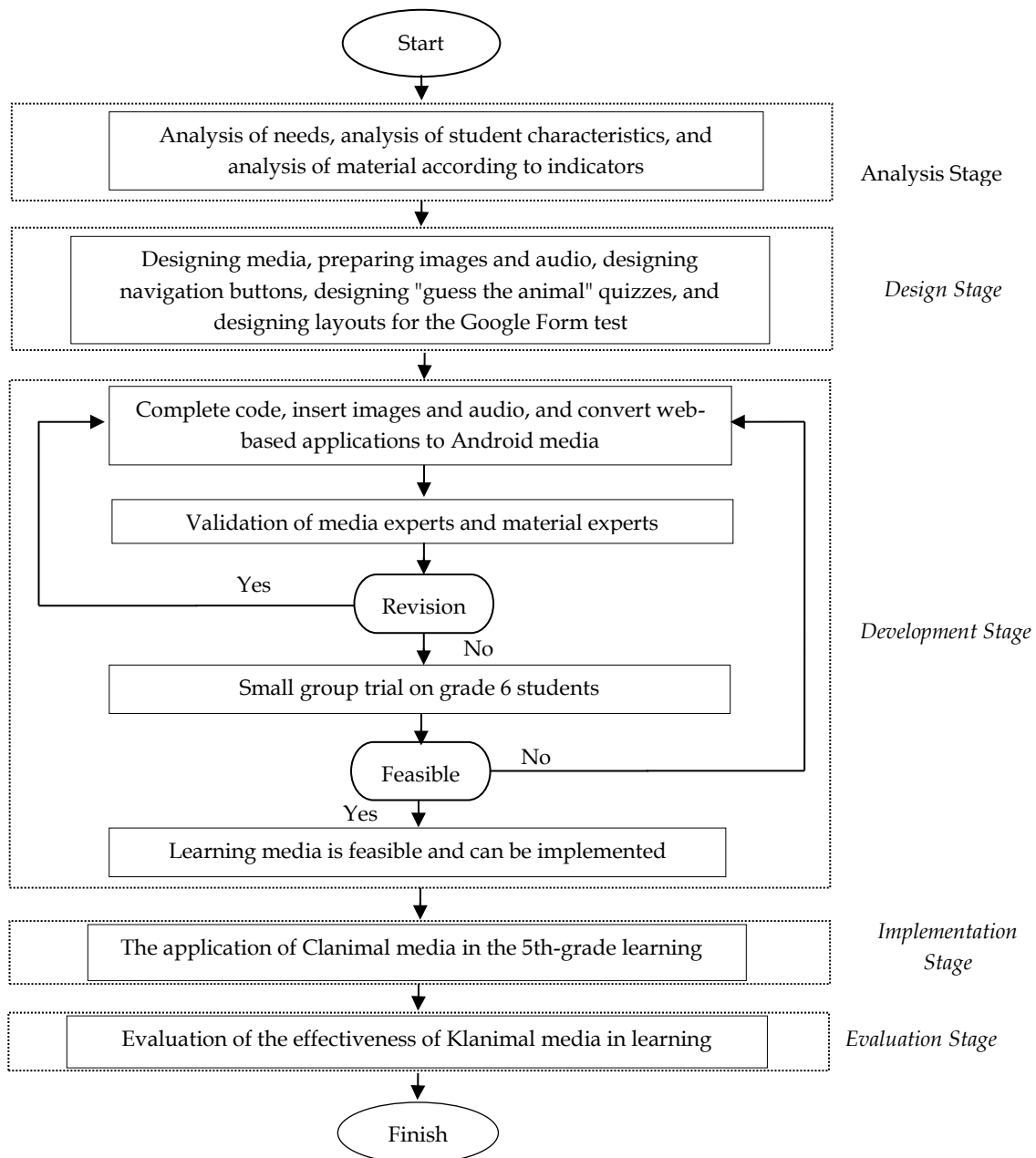
Figure 1. Klanimal Media Development Stages

The development stage is realizing Android-based interactive learning media (Muttaqin et al., 2021). The development of Klanimal learning media will be packaged in .apk format. After the learning media is developed, test the product's feasibility. The purpose of this due diligence is to determine the level of validity and feasibility of Klanimal media. The product feasibility test is carried out by giving a questionnaire to the validation of media experts and material experts. The validation of Klanimal learning media consists of media expert validation and material expert validation. Media expert validation was carried out to know the feasibility and effectiveness of the media that had been developed. Media experts at the Muhammadiyah University of Sidoarjo carried out this media expert

validation. Material validation is carried out to assess whether learning media development is by the existing material. The material expert validation was carried out by a material expert, namely a class V teacher from an elementary school. The next stage was to conduct a small group trial involving ten students of class VI.

Data analysis techniques to determine the eligibility of the media using the formula (Rindiani & Hasanah, 2022):

$$P = \frac{\text{Total score obtained}}{\text{Maximum total score}} \, 100\%$$

Description:

P = Research Percentage

This development research uses a questionnaire instrument to collect data from the results of expert reviews (Widyowati et al., 2020). The data analysis technique used in this study is descriptive quantitative, explaining the average results of the validity test. The validation assessment criteria used are described in Table 1 (Rindiani & Hasanah, 2022):

Table 1. Criteria for Validity

Percent validity	Criteria
81% - 100%	Very Feasible / Very good
61% - 80%	Feasible / Good
41% - 60%	Feasible Enough / Good Enough
21% - 40%	Less Decent / Less Good
0% - 20%	Very Inadequate / Very Poor

The questionnaire instrument uses several indicators with measurements using a Likert scale of 4 scales, namely, Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1) (Formplus, 2020). The assessment aspects of the media expert validation questionnaire include language, presentation, and appearance of the media being developed. Meanwhile, the assessment aspects of the material expert validation questionnaire include content feasibility, language, and presentation. The media expert validation indicators are described in Table 2, and the material expert validation is described in Table 3 (Rindiani & Hasanah, 2022). This study also used a media response questionnaire to measure the response of test subjects to media use. Response questionnaire indicators are shown in Table 4 (Arwan, 2021).

Table 2. Media Expert Validation Indicators

Assessment Aspects	Indicator
Serving technique	1. Ease of use of media 2. Ease of audio operation (on/off) 3. Navigation buttons are easy to use 4. Clarity of material presentation

Assessment Aspects	Indicator
Feasibility of presentation (contents)	1. Material features, "tebak hewan" and "quiz," work well 2. Main menu features and material menus are easy to run 3. The suitability of the button layout, text, and images
Graphical feasibility	1. Image layout 2. Letter Layout 3. Button layout 4. The size and font of the letters 5. Color of writing 6. Color image 7. The characteristics of the image match the material

Table 3. Indicators of Material Expert ValidationTabel

Assessment Aspects	Indicator
The suitability of the material with basic competence	1. Clarity of material decomposition 2. Compatibility of Basic Competency 3. The accuracy of the use of words
Accuracy and correctness of the material	1. Conformity of the material with the quiz 2. Appropriateness of learning objectives 3. Appropriateness of quiz exercises with the level of students' thinking abilities
Language	1. Legibility of writing 2. Clarity of information 3. Language according to the stage of student development 4. Use of words effectively and efficiently

Table 4. Indicators of Trial Subjects

Assessment Aspects	Indicator
Cognitive	1. Understanding of classification 2. Mention the characteristics of herbivorous animals 3. Mention the characteristics of carnivorous animals 4. Mention the characteristics of omnivorous animals 5. Match animals with food
Affective	1. Curiosity 2. Interest 3. Motivate
Conative	1. Play "tebak hewan" 2. Responding to quiz questions

The implementation stage is carried out when the learning media developed meets the eligibility criteria and has gone through the revision stage. Implementation of the application of Klanimal learning media was carried out for fifth-grade students at SDN Candibinangun IV Semester 1 Lesson Theme 5. Then pretest and post-test were carried out

to assess the effectiveness of the media used. The research design uses one sample pretest and post-test, described in Table 5 (Sugiyono, 2021).

Table 5. Research Design

Pretest	Treatment	Post-test
O_1	X	O_2

The population in this study is from several elementary schools in the Pasuruan district. The sample in this study was fifth-grade students at SDN Candibinangun 4 Sukorejo, which consisted of 19 students. Researchers used a saturated sampling technique because the number of samples was less than 30 students. The pretest and post-test data analysis results will be calculated using the N-Gain method. The following is the N-Gain calculation formula (Sugiyono, 2021):

$$\text{N} - \text{Gain} = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

Description

N-Gain   : Declare the gain normality test

Spost   : Declare the posttest value

Spre   : Declare the pretest value

Smaks   : Declare the maximum score

The criteria used to interpret the N-Gain calculation results are shown in Table 6 below (Sugiyono, 2021) :

Table 6. Interpretation of N-Gain Results

N-Gain Value	Category
g > 0,7	High
0,3≥ g ≤ 0,7	Currently
g < 0,3	Low

The evaluation stage assesses the application of Klanimal media in learning at SDN Candibinangun IV grade 5. At this stage, a reflection is made on the results of applying Klanimal media from the pretest and post-test analysis.

C. Result and Discussion

Result

This research model consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. In the analysis phase, conducting class observations and unstructured interviews with grade 5 teachers in several elementary schools in the Pasuruan district consisted of analyzing needs, student characteristics, and material. The results of the

needs analysis show that teachers need media that can support students' understanding of abstract science learning for students. Analyzing student characteristics is useful for obtaining data about gender, age, and attitudes of students in science subjects during learning, and most students have smartphones which are still not optimal for learning activities. Meanwhile, material analysis activities related to KD and subjects will be included in developing this Android-based media.

The next stage is the design stage which is the display design stage of the media to be developed, preparing images and audio, designing the navigation buttons, designing the "tebak hewan," and designing the Google Form test layout. In designing display designs or storyboards using the Canva application to make it easier to develop Android-based media. A storyboard can be seen in Figure 2
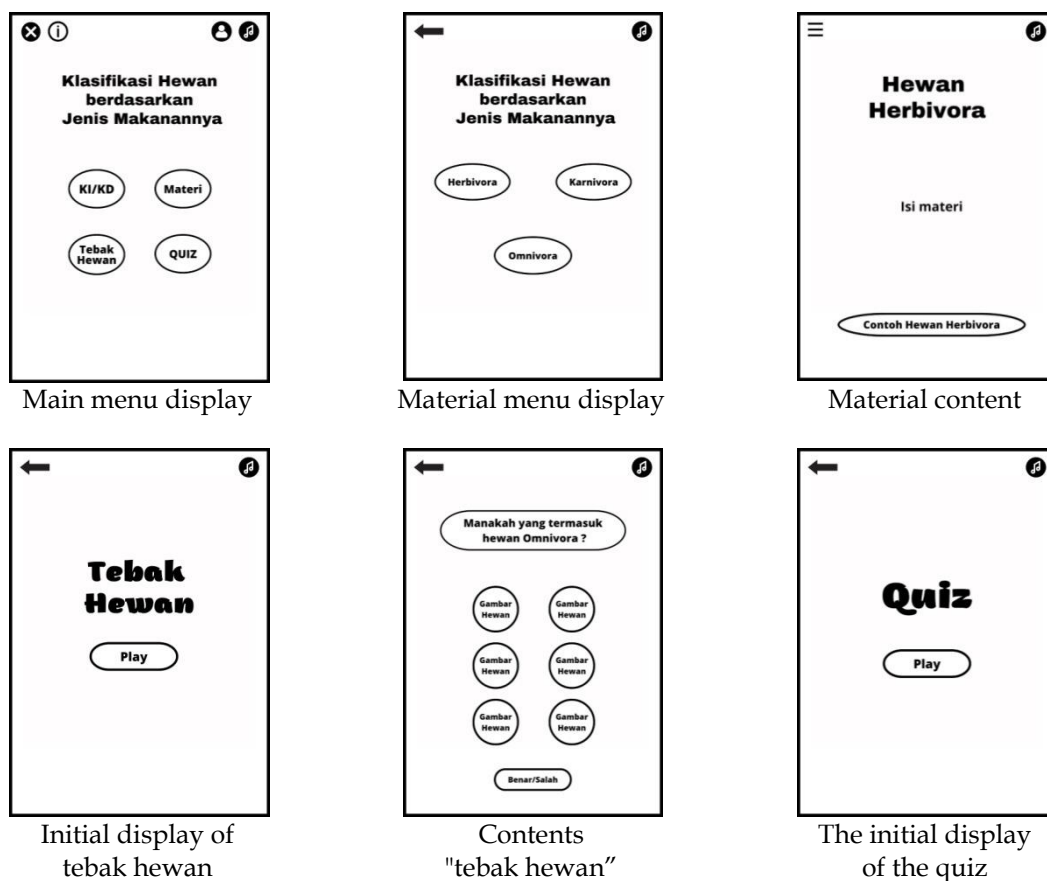
Main menu display	Material menu display	Material content
Initial display of tebak hewan	Contents "tebak hewan"	The initial display of the quiz

**Figure 2.** Klanimal Media Storyboard

The next development stage is realizing Android-based interactive learning media (Muttaqin et al., 2021). At this stage, use the software Construct 2 in portrait format. The initial menu display on this clinical media contains the title of the material and several navigation buttons. These navigation buttons include buttons to activate and deactivate background audio, a profile button that contains developer profiles, an information button that contains instructions for using clinical media, and an exit button that functions to exit

the application. In addition, there are several menus consisting of the KI/KD menu, the material menu, the "tebak hewan" menu, and the quiz menu. Users can choose the menu according to what they want to learn. The main menu display will be presented in Figure 3.

Figure 3. Main menu display

The KI/KD menu display contains core competencies, basic competencies, and learning objectives, which are presented in the material on clinical media. Then, there is a material menu displaying the material to be studied in clinical media that has been adapted to basic competencies. The material is arranged more concisely to make it easier for students to understand the material and stay energized in learning. The display of the KI/KD menu and material menu will be shown in Figure 4.
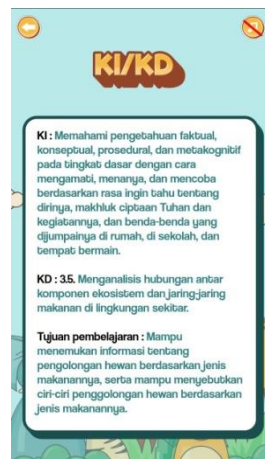
KI/KD menu display   Material menu display

Figure 4. Display of the KI/KD Menu and Material Menu

The "tebak hewan" menu display is a guessing game on animal pictures which is useful for training students to remember the material presented in clinical media. In guessing this animal, a question and a picture will be shown; if the student guesses the picture correctly, a yellow tick will appear with the word "correct" and vice versa. If the

student guesses the picture wrong, a red cross will appear with the word "wrong." In addition, there is a quiz menu containing 20 questions that test students' knowledge of the material presented. The layout of this test is connected to the Google Form, aiming for students to find out the scores obtained and the correct answers after working on the test questions. The display of the "tebak hewan" menu and the quiz menu will be shown in Figure 5.

Display menu "tebak hewan"　　　　　　　Display quiz menu

Figure 5. Display of the Animal Guess Menu and Quiz Menu

Media that has been developed will be validated by media experts and material experts. The validation process is carried out to determine the feasibility of the media and suggestions for media improvement. Media expert validators, namely lecturers from Muhammadiyah Sidoarjo University, and material expert validators, namely class V teachers at SDN Candibinangun 4 Sukorejo. The percentage results from media and material experts are shown in Table 7.

Table 7. Results of the Percentage of Media Experts and Material Experts

No	Validators	Score obtained	Percentage	Category
1	Media expert	50	89%	Very Feasible
2	Material expert	34	85%	Very Feasible

Based on the data from Table 7 above shows the evaluation results of two validators, namely the expert media validator, obtaining a score of 50 with an eligibility percentage of 89%; it can be concluded that the material evaluated by media experts is considered very feasible, the material expert validator obtains a score of 34 with an eligibility percentage of 85% as well considered very feasible category. Criticism and suggestions from the validators as revisions to improve the appearance of the clinical media that have been made. Revisions were made according to input from validators, media experts, and material experts. Revisions are shown in Table 8.

Table 8. Revision of Klanimal Media

Revised Indicators	Media Before Revision	Media After Revision
Added KI/KD menu		
Changed the author profile menu and instructions to become a button above the material title		

The revised media was then tested on a small scale with ten grade 6 students at SDN Candibinangun IV Sukorejo. The selection of class VI students was because students had received previous animal classification material. The trial results obtained an average percentage of 89.8%, so this clinical media is categorized as suitable for learning.

The next stage is the implementation stage: implementing clinical media in-class learning activities. 19 grade 5 students at SDN Candibinangun IV Sukorejo were selected for the research sample. Learning activities by giving pretest questions with as many as 20 questions, applying animal media, and giving post-test in the form of quizzes on animal media with as many as 20 questions. The average N-Gain score was calculated using Microsoft Office Excel 2007 software. The average N-Gain score is shown in Table 9.

Table 9. The Average N-gain Score

No	Student's Name	Value		Post - Pre	Maximum Score – Pre	Score
		Pre	Post			N Gain
1	AAM	60	80	20	40	0.50
2	AI	55	85	30	45	0.67
3	FM	40	80	40	60	0.67
4	F	35	80	45	65	0.69
5	H	55	90	35	45	0.78
6	KA	55	90	35	45	0.78
7	LAM	45	95	50	55	0.91
8	LH	60	85	25	40	0.63
9	LJ	50	85	35	50	0.70
10	MA	35	80	45	65	0.69
11	MI	55	90	35	45	0.78
12	MK	65	75	10	35	0.29
13	MW	65	75	10	35	0.29
14	NR	60	90	30	40	0.75
15	S	65	90	25	35	0.71
16	SNADA	35	95	60	65	0.92
17	U	45	90	45	55	0.82
18	ZI	60	95	35	40	0.88
19	ZM	40	90	50	60	0.83
	Average	51.58	86.32	34.74	48.42	0.70

There was an increase based on the results of the pretest and post-test research data conducted on grade 5 students at SDN Candibinangun IV Sukorejo, consisting of 19 students. The average pretest and post-test i.e., scores, are added and then divided by the number of samples. The results of the data analysis showed that the average pretest score was 51.58, while the average post-test score was 86.32. This shows increased students' understanding after using Android-based clinical Science learning media.

The N Gain score measures the increase in students' understanding from the pretest to the post-test. N Gain scores range from 0 to 1, and the higher the score, the greater the increase in student understanding. Students' N Gain scores ranged from 0.29 to 0.92. The N Gain score above 0.5 indicates that most students experience a significant increase in understanding after using Android-based science learning media. N Gain scores close to 1 (such as 0.91 and 0.92) indicate a very good increase in understanding. The average N Gain score of students is 0.70 indicating a significant increase in understanding.

The evaluation stage of the results of this study showed that the use of android-based science learning media effectively increased the understanding of grade 5 students at SDN Candibinangun IV Sukorejo regarding animal classification material. A higher N Gain score

indicates that the learning media positively and significantly impacts student understanding.

Discussion

Android-based learning media can improve students' understanding of learning material, especially media that has clear image visualization. With image visualization, you can visualize abstract or complex concepts. Vivid visualizations allow students to understand and remember information better. This aligns with research (Kustandi et al., 2021) which utilizes visual media as a learning medium to help students improve their mastery of events that cannot be presented in class.

Clinical media combines text, images, and audio in learning media that can reach various student learning styles. Using various media gives students a greater opportunity to engage and understand the subject matter. So, with this android-based clinical media, students can participate directly, answer questions, or solve problems. With active engagement, students can apply the knowledge they learn, increasing understanding and critical thinking skills. Research (Novanto et al., 2022) shows the same results: interactive learning media can increase student participation.

Using interesting, interactive, and varied android-based clinical learning media can increase student motivation in learning. When students feel interested and involved in the learning process, they are more likely to focus, participate, and gain a better understanding of the subject matter. The study's results (Fitriani & Negara, 2021) explain that interactive learning media can motivate students while studying.

D. Conclusion

The analysis of the study results showed that Klanimal learning media affected increasing students' understanding of science material, classifying animals based on the type of food. Using Klanimal learning media was easy to understand because the science concept presented to students was more concrete through pictures, sound, and text. In addition, students are more motivated to participate in science learning. Students' long-term memory can develop because they use interactive audio-visual.

The results of this study can be used to assist teachers in improving science learning outcomes by classifying animals based on the type of food they eat. The clinical learning media can be a reference for using interactive learning media in grade 5. By using clinical learning media, the learning process is expected to be more effective.

Future research can use a control group for the implementation stage because there is a comparison between the group that uses clinical media and the group that does not. Then the number of samples can be increased to reflect the characteristics of the primary school class population.

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