Media Pendidikan Gizi dan Kuliner

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Development of Nutritional Education Media for Fruit and Vegetable Snakes Based on Adobe Flash Cs6 for Primary School Children

Ni Made Putria Mutia Andini, Esi Emilia, Dina Ampera, Erli Mutiara, Juliarti

Nutrition Study Program, Universitas Negeri Medan, Indonesia

Correspondence: E-mail: nimadeputri25@gmail.com

ABSTRACTS

Lack of nutrition education media related to the benefits of fruits and vegetables for elementary school children so that knowledge related to fruits and vegetables is still lacking. One of the efforts that can be done is to create a nutrition education media. This study aims to develop educational media for snake ladder nutrition based on Adobe Flash CS6 to increase nutritional knowledge about fruits and vegetables in elementary school children and to determine the feasibility of nutrition education media for snake ladder fruit and vegetables based on adobe flash CS6 for elementary school children. This research is an R & D research with the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation) conducted at SDN 104196 Tandam Hulu II. The sample in this study was a sample of the validity of the material and media, namely lecturers and teachers, totaling 3 people, and a trial sample containing 5 people, as well as a large group trial sample consisting of 28 people. The results of the validity test carried out by media experts were 93 with 93% eligibility and the category was very feasible. The results of the validity test conducted by two material experts were 94% and 96% with a very feasible category. And the results of the feasibility test of students with the eligibility category of 90.22% with the appropriate category.

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1. INTRODUCTION

The period when children begin to be considered responsible for their behavior in relationships with parents, peers and other people. At this age, children begin to acquire the basics of knowledge to prepare themselves for adaptation and certain skills in the future (Handayani, 2021).

Low nutritional knowledge of fruit and vegetables can influence children's consumption of vegetables and fruit. Whereas Vegetables and fruit are very important in a balanced diet because they are a source of vitamins and minerals. According to Pradini Indira, et al (2021), although the need is relatively small, the function of vitamins and minerals can hardly be replaced, so meeting the need for consumption of these substances becomes essential. Because vitamins cannot be formed by the body, they must get supplies from outside the body, especially in the form of vegetables and fruit.

Seeing this problem, efforts are needed to overcome the lack of knowledge about fruit and vegetable consumption in school-aged children. One effort that can be made is by providing nutrition education because changes in a person's knowledge can begin with providing information.

In activities to provide information through nutrition education there is a system, in which there are a number of components that are interconnected with each other in order to achieve the goal. Some of the components referred to include: (1) objectives, (2) teaching materials/materials, (3) methods, (4) tools/media and, (5) evaluation.

This research will be carried outat SDN 104196, precisely on Jalan Inpres Pasar 4 Cina, Hamparan Perak District. Researchers chose this location because based on observations made on 25 elementary school children in class V of elementary school, it was discovered that 22 of the 25 children (88%) did not know about the benefits of fruit and vegetables. Based on interviews with 5th grade elementary school teachers, the results of the interviews showed that elementary school children at SDN 104196 had never received nutrition education in the form of specific benefits of fruit and vegetables, namely only knowing 4 healthy 5 perfect in science lessons.

The media development that will be carried out aims to make nutrition education in the form of the snakes and ladders game more interesting, so that children can understand the meaning intended by researchers, so that the process can be carried out by learning while playing. This can be seen from the research of Sari Dita, et al (2021) entitled Development of Interactive Social Science Learning Media Based on Problem Based Learning and Snakes and Ladders. This research uses the development of Borg and Gall with validation results with an average percentage of 85.17%. This interactive learning media is suitable for use in fourth grade social studies.

2. CONTENTS

The place of this research is at SDN 104196, precisely on Jln. Pasar Inpres IV Cina, Hamparan Perak District, Deli Serdang Regency, North Sumatra Province. This research will be carried out from September 2021 to April 2022.

The targets of the development of the snake and ladder fruit and vegetable nutrition education media produced were 33 class V students and class V teachers at SDN 104185 Sei Semayang.

The research carried out in this research is a type of development research or Research and Development (R&D), which aims to develop a new product or improve an existing product. using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model development method (Sugiyono, 2017). which aims to develop nutritional education media

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in the form of a snake and ladder fruit and vegetable game based on Adobe Flash CS6 for elementary school children.

1) Analysis stage, at this stage the author collects all the information that will be used as material in making the product. The product produced is the Fruit and Vegetable Snakes and Ladders Game as a nutritional education. The collection of this information is a needs analysis and an analysis of the software needed to make the product. 2) Design Stage, at this stage the author develops the design and concept that will be developed in the Nutrition education media in the form of fruit and vegetable snakes and ladders by making sketches and selecting colors and images in the boxes on the snakes and ladders. 3) Development Stage, at this stage the author creates a product according to the design that was created previously. The development stage includes making a board game and expert testing. Making a board game starts with making boxes numbered 1-100, then selecting colors for the boxes to make them attractive. Each box will contain nutritional messages in the form of the benefits of fruit and vegetables. Expert testing, the completed media will be assessed by material experts (lecturers). This media testing is based on predetermined criteria. Validation is carried out to obtain information about the suitability of material in the media. The suggestions and comments provided will be used to carry out phase I revisions to the media. After the first stage of revision has been completed, the media will be handed back to the material expert for validation. Stage II validation is carried out by one media expert and two material experts. After the media is declared suitable, the media will be tested on users. 4) Implementation Stage, the implementation stage is the trial stage when the media meets the criteria. At this stage testing will be carried out by a small group of around 5 students, then it will be continued on the entire sample, namely 28 students. 5) Evaluation stage, to see whether the product in the form of fruit and vegetable nutrition education media is successful in accordance with initial expectations or not.

2.1 Material and Media Expert Assessment

The media expert and material expert validation questionnaire was used to determine the level of suitability of the Adobe Flash CS6-based snake and ladder game nutrition education media with material on the benefits and content of fruit and vegetables for elementary school children, where the questionnaire contained five types of answers for each question item. The data is given a score as follows.

Table 1. Answer Score Data

Answer	Score
Very good	5
Good	4
Pretty good	3
Not good	2
Very not good	1

According to Sugiyono (2018), the assessment questionnaire test by material experts and media experts on the nutrition education media of the Adobe Flash CS6-based game Snakes and Ladders with material on the benefits and content of fruit and vegetables for elementary school children was carried out by comparing the scores by the validator () with the maximum number of scores given. has been determined in the questionnaire (N) with the following formula: f

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$$P = \frac{(f)Perolehan\ skor\ oleh\ validator}{(N)skor\ yang\ diharapkan} \times 100\ \%$$

Meanwhile, to calculate the average value of feasibility percentage according to (Sugiyono, 2018) use the following formula:

$$M_x = \frac{\sum x}{(N)} \times 100\ \%$$

Information :
Mx = average percentage sought
$\sum x$ = the sum of the existing percentages
N = the number of presentations themselves

Table 2. Eligibility Criteria Intervals

Percentage	Criteria
84% - 100%	Very worth it
68% - 83%	Worthy
52% - 67%	Decent enough
36% - 51%	Not worth it
20% - 35%	Not feasible

2.2. Media Assessment by Students

The questionnaire from the assessment of student responses was used to determine students' opinions regarding the appropriateness of the Adobe Flash CS6-based snakes and ladders game nutrition education media with material on the benefits and content of fruit and vegetables for elementary school children. The data obtained by the examiners was analyzed using quantitative data. The answers are then measured on the Guttman Scale questionnaire. In this stage, two categories of answer choices are used, namely "Yes" and "No" using a checklist (Sugiono, 2017)

Table 3. Categories of Guttman Scale Assessment Score

Score	Information
1	Yes
0	No

The calculation of the percentage of student responses is carried out using the formula according to Sugiyono (2017) as is the assessment of experts. The formula used is as follows:

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$$P = \frac{\sum x}{\sum y} \times 100\ \%$$

Information:
P = Percentage Questionnaire
$\sum x$ = Total Number of Student Answers
$\sum y$ = The total maximum score

Furthermore, the quantitative data that has been obtained is then interpreted into quantitative values with the following score criteria:

Table 4. Student Assessment Score Criteria

Score	Assessment Classification
Score ≥ 50%	Worthy
Score < 50%	Not feasible

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. Media Development

Based on the method or stages of development, there are research steps consisting of ADDIE, namely analysis, design, development, and evaluation. The research steps are described as follows.

1. Analysis Stage (Analysis)

   The first stage of developing this research was analyzing needs by making observations at SDN 104196 Tandam Hulu II. At this stage the researcher collected data such as basic competency data, class 5 learning materials, as well as the needs of students and teachers and the supporting capacity for using media as a reference for development.

   Based on the results of an interview with the 5th grade teacher at SDN 104196 Tandam Hulu II, information was obtained that during the pandemic, elementary school children did not carry out full school activities at school due to face-to-face restrictions imposed by the school, this made elementary school children often play on cellphones, especially games. on their cellphones, and elementary school teachers do not yet have the ability and time to create up-to-date educational media for today's elementary school children, even though in grade 5 elementary school children already have their own cellphones to support technology-based educational media.

2. Planning Stage (Design)

   The second stage is designing the gameboard for the snakes and ladders game that will be developed. Activities carried out in the planning stage are looking for relevant sources/references, preparing research instruments and even the game format that will be used. The steps in arranging a gameboard for a game include: (1) determining the appearance of the board game, adjusting basic competencies and learning materials. (2) designing the format of the board game and the content of the game.

3. Development Stage (Development)

   At this stage, development begins in accordance with the planning that has been made, namely with the analysis that has been carried out previously and with the design concept

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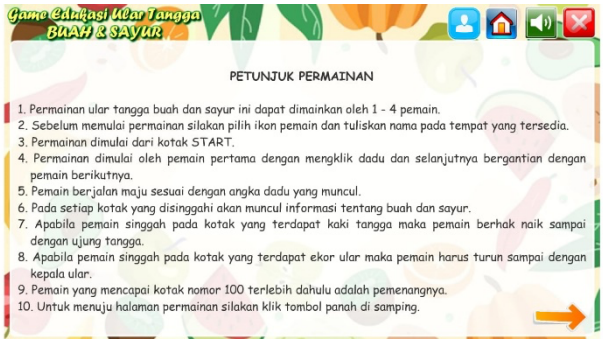
that has been designed. The steps for creating the fruit and vegetable snakes and ladders nutritional education game media are as follows:

a. Create an initial display
   This section is created as an initial display when the media is first opened, where there are titles from educational media and on this panel there is a "Start" button which is used to run the game.

b. Create a Instructions view
   The instructions sub menu contains instructions for playing the fruit and vegetable snake and ladder game. On this panel there are also on/off buttons for music, developer profile, and an exit button.



c. Make a snakes and ladders game
   From the next instructions menu there is a player selection panel, namely a player consisting of 2-4 players, where in this panel there is a player name column and players can choose the character they want to use in the game later. Then in the next panel, by clicking the "Start" button, the game board will appear. This panel is created via the properties panel and tools panel in Adobe Flash CS6. By creating plots, images and icons or other objects. The number of plots in this snake and ladder game is 100 plots.

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d. Creating Material Views

Each plot in the snakes and ladders game contains material/information related to fruit and vegetables, both the benefits and contents of fruit and vegetables accompanied by pictures to make elementary school children interested in this game. When the player stops on one of the tiles, information will appear as in the picture.

4. Implementation Stage

The next stage is implementation. At this stage, testing is carried out on the media by conducting trials on small and large groups. Testing is carried out by sharing links to download the media that will be used by elementary school children. Researchers distributed the link to elementary school children via their class WhatsApp group.

5. Evaluation Stage

The final stage of the process of developing nutritional education media is the evaluation stage. This process is used to measure the suitability of an educational media, revise the media to produce media that is ready to be tested on students to determine the suitability of the learning media.

3.1.2. Feasibility test

Table 5. Media and Material Expert Validation Results

The experts	Phase I Validation	Phase II Validation	Category
Media Expert	85 %	93 %	Very Worth It
Material Expert I	82%	94%	Very Worth It
Materials Expert II	85 %	96 %	Very Worth It

Based on the table above, it can be concluded that the media validation results in stage I obtained a score of 85 out of a maximum score of 100, so that the feasibility obtained was

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85% and could be categorized as "Very Eligible". However, improvements are still being made according to suggestions and input provided by media expert validators.

Based on suggestions and input from aa media experts, improvements and updates were made to the media in stage I validation. Then stage II validation was carried out on March 9 2022 and obtained a score in table 10 above of 93 out of a maximum score of 100. So the feasibility obtained was 93% and researchers could continue to the next stage.

Based on the table above, it can be concluded that the validation results for material 1 in stage I obtained a score of 74 out of a maximum score of 90 with feasibility of 82% and can be categorized as "Very Eligible". However, improvements are still being made in accordance with suggestions and input provided by material experts. Meanwhile, the score obtained from material expert validation II stage I obtained a score of 77 out of a maximum score of 90 with eligibility of 85%.

After receiving direction and input from material experts I and II, the author made improvements and updates to the fruit and vegetable snakes and ladders material. After carrying out improvements, the validation phase II was carried out on March 21 2022 with a score obtained by material expert I of 85 with 94% feasibility and a score obtained by material expert II of 87 with 96% feasibility in the very feasible category, so the author could continue to the next stage.

The results obtained from expert assessments and after revisions are carried out, the next stage is testing the product/media being developed. At this stage, the feasibility test was carried out in a small group of 5 class V students at SD 104196 Tandam Hulu II. The use of media begins by distributing media via WhatsApp to students' cellphones, explaining instructions for using the media. After using the media, researchers give student respondents a questionnaire to obtain data regarding the suitability of the snakes and ladders educational game media.

Table 6. Small Group Feasibility Test Results

No	Category	n	%
1	Worthy	5	100%
2	Not feasible	0	0
	Total	5	100%

Based on the table above, 5 students at SDN 104196 obtained a score of 83 out of a total score of 95 with a percentage of 87.6% so that it can be categorized from these five students as a suitable fruit and vegetable snake and ladder nutrition education media at 100%.

After carrying out small group trials, the next stage is large group trials. The trial was carried out on 28 students at SDN 104196 Tandam Hulu II. The use of media begins with sharing the download link to students via the WhatsApp group, explaining the material to be discussed, then playing the fruit and vegetable snakes and ladders game, and finally filling out a student response questionnaire to the media.

Table 7. Results of Large Group Trials

No	Category	n	%
1	Worthy	28	100%
2	Not feasible	0	0
	Total	28	100%

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Based on the results in table 16 above with 28 students at SDN 104196, using a questionnaire with 19 questions, a score of 480 out of a total score of 532 was obtained with an eligibility category of 90.22%. Based on the eligibility category in table 7, it is classified as eligible. So it can be concluded that the snake and ladder fruit and vegetable nutrition education media for elementary school children is suitable.

3.2. Discussion

The feasibility of the snake and ladder fruit and vegetable nutrition education media was obtained from data from the validity of media experts, material experts, educational practitioners, small group trials and large group trials. Eligibility data is described as follows: Data obtained from the validation results of media expert Mr. Dr. Rachmat Mulyana, M.Sc. The first validation stage was carried out face-to-face on February 8 2022 and obtained a score of 85 out of a maximum score of 100 with an eligibility percentage of 85%, so it was categorized as "Very Eligible" and then revisions were carried out so that the media developed was better. Furthermore, the second validation was carried out on March 9 2022, obtaining a score of 93 out of a maximum score of 100 with a percentage of 93% and was categorized as "Very Eligible".

Data obtained from validation results from material expert Mrs. Risti Rosmiati S.Gz, M.Si. The first validation stage was carried out online via Zoom on February 21 2022 with a score of 74 out of a maximum score of 90 with a percentage of 82% in the "Very Eligible" category. However, revisions are still being made to the media in accordance with criticism and suggestions from experts. Furthermore, the second validation was carried out on March 21 and obtained a score of 76 out of a maximum score of 90 with 84% eligibility in the "Very Eligible" category. Data was obtained from material expert validation II by Mrs. Lila Novita Sari S.Pd conducted face to face on 21 2022 obtained a score of 77 out of a maximum score of 90 with a percentage of 85% and was categorized as "Very Decent". And stage II material validation was carried out on March 22 2022 with a score of 87 out of a total score of 90 with 96% eligibility in the very feasible category. Data obtained from the results of a small group trial on March 22 2022 with 5 students at SDN 104196 obtained a score of 83 out of a total score of 95 with a percentage of 87.6% so it could be categorized as "Decent". Data was obtained from the results of a large group trial on March 25 2022 with 28 students getting a score of 480 out of a maximum score of 532 with a percentage of 97% so they were categorized as "Decent".

Based on the data results above, the average percentage of feasibility of snake and ladder fruit and vegetable nutrition education media was 89% in the "Very Appropriate" category. This is in accordance with previous research conducted by Purnamasari, Nurna (2020) which stated that the interpretation of the percentage of media feasibility at an achievement level of 81-100%, educational media can be categorized as very feasible. And also in accordance with research conducted by Widoyoko (2018), media with an interpretation percentage above 80% is classified as very good, with very appropriate information. This is also reinforced by Muzzalifa's (2020) research, which states that the range of media suitability percentages is said to be very feasible at 81-100%. So it can be concluded that the Adobe Flash CS6-based snake and ladder nutrition education media for elementary school children is "Very Feasible" to be used as media in the learning process in class V at SDN 104196 Tandam Hulu II.

4. CLOSING

The conclusions that can be drawn from the research that has been completed are as follows: The process of developing fruit and vegetable snake and ladder nutrition education media

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based on Adobe Flash CS6 consists of analysis, design, development, implementation, and evaluation. And the final result of this product is a fruit and vegetable snake and ladder game. The results of the feasibility of educational media by media experts were 93% and categorized as "Very Appropriate", and the average assessment results from material experts were 89.25% with the category "Very Appropriate", in the students' testing it was 87.36% so it could be categorized "feasible" and large group testing obtained 90.22% so it was categorized as "feasible". Based on the results of the research that has been carried out, there are several suggestions that the researcher would like to convey as follows: For student, the snake and ladder fruit and vegetable nutrition education media can be used as an alternative for students to learn by utilizing technology. This media is easy to carry and use anytime or anywhere. So students are advised to use snakes and ladders media to increase their knowledge regarding fruit and vegetables. For Teachers, learning media is a tool to support teaching and learning activities. Teachers are advised to utilize this learning media optimally to direct students in using this media. For Further Researchers, who later want to develop fruit and vegetable snake and ladder nutritional education media, they can develop it with different materials to create varied media that will be useful in the future.

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