International Journal of Arts and Social Science www.ijassjournal.com
ISSN: 2581-7922,
Volume 8 Issue 1, January 2025

Development of Fruits Game Media Based on Traditional Games to Improve Math Learning outcomes of 3rd Grade Students' of Ngadi Elementary School

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ABSTRACT: *Using the units of weight material, this study aims to create a learning media modeled based on the classic engklek game and assess its validity, practicality, and efficacy. Research and Development is the methodology utilized in this study, and both quantitative and qualitative data are provided. Quantitative data provide in numbers, and qualitative data in words. Data on the completeness of learning outcomes of 3rd graders Ngadi Elementary School, the average value obtained is 43, students complete with percentage of 11.1% (3 students), students who are not complete have a percentage of 88.9% (24 students). Media validity results obtained 81% from media experts, and 87% from material experts. Practicality by students obtained a percentage of 85.7% and 84.3%, the results of practicality by teachers obtained a percentage of 96%. Paired sample t test resulted in a Sig (2-tailed) value of 0.000 <0.05, which means Ho is rejected and Ha is accepted, showing media efficacy is determined from pre-test and post-test. There is statistically significant in learning between before and after using media, it means that Ha accepted and Ho rejected. So, use Fuits Game media is effective to improve the learning of 3rd graders Ngadi Elementary School.*

KEYWORDS- *Fruits Game learning media, learning outcomes*

I. INTRODUCTION

In terms of the welfare of a country, education is a crucial medium. One of the functions of education is to preserve and disseminate existing cultural practices and knowledge. Education goes hand in hand with educational activities. Educators and students engage in learning activities together with the aim of achieving common goals (Rahmadhani, 2022). Educators, learning materials, physical space and student readiness are all necessary for students to reach their full potential as learners. Teachers use learning media to provide knowledge to their students. Kustandi and Darmawan (2020) state that the availability of learning media can assist educators in presenting and outlining course content in a way that communicates learning objectives effectively.

Understanding mathematical ideas is essential to many aspects of daily life, and this is where primary school math teaching really comes into play. We use our math skills unconsciously every time we buy or sell something. Students' conceptual understanding is critical to their success. in math class (Ruqoyyah, et al., 2020). However, in understanding mathematical concepts, problem solving and concrete media are needed to support students in learning and understanding mathematics. The lack of a medium in learning could inhibit the teaching and learning process (Sumarsih, 2016). However, in reality, many educators still use the lecture method as a learning method. This causes students to lose interest and enthusiasm for the learning process.

Grade 3 students of SD Negeri Ngadi are still taught by instructors who rely on the lecture method. To convey material to students, educators only rely on textbooks and blackboards. As a result, many students find

the learning process boring. This has an impact on student learning outcomes because they did not understand the lesson presented by the teacher. In addition, interviews with grade 3 students of SD Negeri Ngadi show that instructors have little time and energy to develop learning materials, and students are not enthusiastic about learning mathematics because they consider mathematics a challenging subject, especially for subjects such as weight measurement. . In learning mathematics, there is an achievement value (KKTP) that must be reached by students, namely with a score of 75. The data on the completeness of the learning outcomes of students in 3rdgradeNgadi Elementary School, namely, with the average scores of 43, the number of students completed with a percentage of 11.1%, namely 3 students and students who did not complete had a percentage of 88.9% with a total of 24 students.

With the problems described above, the solution provided by the researcher is to develop a media fruits game based on the traditional game engklek on mathematics learning materials for weight units. Game learning media is a game-shaped learning media, where students can learn material using the game media. Games or games are something that is familiar to children, game media is a fun and entertaining tool for children (Fahmi, 2016). At the same time, engklek is a game that has been around for a long time and requires its players to follow a strict agreement when using items and counting to their advantage (Munawaroh, 2017). In the media developed by researchers, game media based on the traditional game of cranklek, which contains unit weight material. Where researchers design this media on a banner according to the shape of the cranklek game, each box contains unit weight material. This media is equipped with puzzles or questions about units of weight that must be solved by the player.

The advantages of the fruits game media based on the traditional game of engklek, namely, game media is a very fun media and can stimulate children's thinking and creativity. Where when used in learning activities it can motivate children and stimulate their thinking on the material being taught. The benefits of using traditional cricket game-based media are that the pattern of the cricket game combined with the material for sorting units of weight can increase the kinetic intelligence of students, personal and interpersonal intelligence and thinking intelligence of students (Sundari & Siregar, 2023). To attract children's attention in learning activities, the design features graphics of fruits and questions that they must answer while playing. So that children can engage in meaningful and entertaining learning.

Previous research has shown that traditional cricket game media is a valid and useful tool for educational purposes (Tasiah et al., 2024). Learning activities that include the ancient cricket game are very successful in motivating students and improving their learning outcomes (Widyastuti et al., 2020). In previous research, the traditional game of engklek was very proven to be able to enhance students' comprehension of material, which is evidenced with the results of the students' learning examinations. This can be summarized that the use of interactive media to students can affect student output (Yanti et al., 2022). If students use engklek as a math learning tool, they will get better results. proven from the results of a research carried out by Widyastuti, et all (2020).

From the results, the researcher aims to conduct a study entitled “Development of Fruit Game Media Based on Engklek Traditional Game to Improve Students' Ability on Unit of Weight Material for Grade 3 Students of Ngadi State Elementary School.” The purpose of making this media is to check whether this media is useful in teaching arithmetic concepts related to units of weight, and if useful, how much success. The benefits of this research are to develop media to make it easy for students' to receive teaching the materials sothat it can be achieved perfectly, and the development of traditional game media can help students to preserve existing culture through traditional games so that they are not forgotten in this modern era.

II. RESEARCH METHODOLOGY

Here, the methodology used is Research and Development (RnD). This product development approach involves mapping the results of a needs assessment with educators and learners to define the efficacy and feasibility the product in the market (Sugiyono, 2018). Analyze, Design, Development, Implementation, and Evaluation (ADDIE) are the five steps that make up the methodology used in this study (Destiana & Riwayati, 2021).

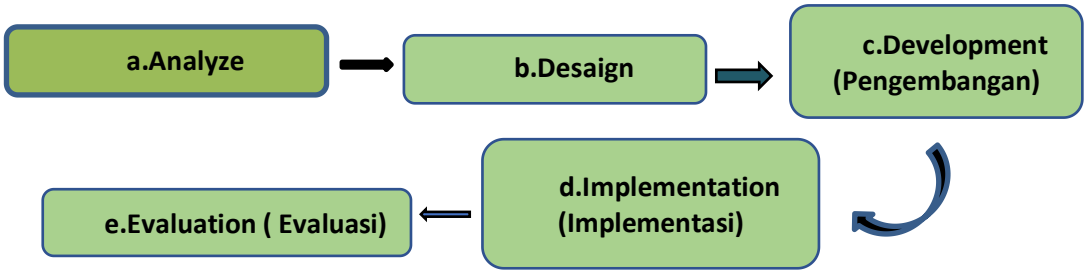


Figure 1: ADDIE Development Model

The researchers hope to create useful, efficient, and legitimate learning media so that students can use it to get lecture material from their lecturers. The location of the research to be carried out by the researcher is located at SD Negeri Ngadi with the research subjects being grade 3 students of SD Negeri Ngadi with a total of 27 students. Scientists will create an educational game themed on units of weight that reminds us of the classic engklek game. The research tools needed to collect validity, practicality, and efficacy data include validation sheets for experts and media experts, questionnaires for teachers and students, and student learning outcomes test sheets. To collect data on media efficacy, small group and large group (field group) trials will be conducted after the development is complete.

This study used qualitative and quantitative descriptive techniques to analyze its findings. Experts in the field of media and materials used qualitative data to analyze comments and recommendations made by validators on the validation sheet to improve the media being made. Quantitative data is used to process data from student learning score sheets in form test scores before and after using the media. The following is the distribution of data and research instruments that will be used:

Table 1. Distribution of data and research instruments

No.	Data	Instrumen	Responden
1.	Need Assesment	Observation Sheet Interview Guidelines	Teacher and Student
2.	Validity	The media experts' validation sheet The material experts' validation sheet	Media Expert Material Expert
3.	Practicality	The teacher respond questionnaire The student respond questionnaire	Teacher and Student
4.	Effectiveness	Question sheets + learning outcomes	Student

The Likert scale table as a guideline for scoring the validation sheet questionnaire in this study is:

Table 2. Likert scale

Criteria	Source
Very Good	5
Good	4
Enough	3
Not Good	2
Very Not Good	1

Source: (Rozak & Murtafi'ah, 2018)

The scores that have been obtained from the validation sheet and the practicality response questionnaire will be is counted by utilizing the following equation:

P= Σx/Σxi x 100%

Description:

X = Percentage of average value

$\sum x$ = Number of answer scores

$\sum xi$ = Total ideal score

Validation sheets from both media and content experts were used to assess the validity test. This categorization sheet displays the following criteria for evaluating traditional engklek game-based game media:

Table 3. Media validity scale

Criteria	Source
Very Valid	81 %- 100%
Valid	61% - 80%
Quite Valid	41% - 60%
Not Valid	21% - 40%
Very Invalid	0% - 20%

Source: (Arikunto, 2019)

To assess the practicality of the media by students using a guttman scale table in the form of "yes" or "no". The guttman scale table can be seen as follows:

Table 4. Guttman Scale

Answer	Source
Yes	1
No	0

Source: (Riduwan, 2015: 43)

The scores that have been obtained from the validation sheet and the practicality response questionnaire will be calculated using the following equation:

P= f/N x 100%

Description:

P = Percentage

f = Total frequency (number of respondents' answers)

N = Number of Respondents

To assess the effectiveness of Fruits Game learning media, it was measured based on the value of pretest and posttest results using the SPSS version 16 program. In order to comparing the result between before and after the treatment of media, the t-test was used.

III. RESULT AND DISCUSIONS

The following are the results of research on making Fruits Game media with the ADDIE model based on the Traditional Engklek Game:

3.1 Analyze

In this study, researchers analyzed the needs of teachers and students' of grade 3 SD Negeri Ngadi. Researchers analyzed the demands of the students' and the teachers through observations, interviews, and documentation studies. Based on observation data, teachers still use lecture techniques in delivering class information and have not utilized learning media. . From the results of interviews with teachers, it is found that teachers have not been able to develop media to support the process of delivering material due to the limited time owned by the teacher, and based on the results of interviews with 3rd grade students of SD Negeri Ngadi, it

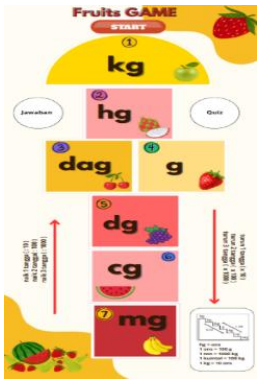
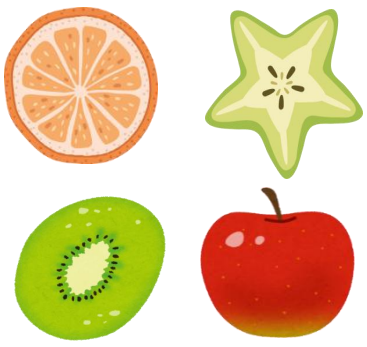
is found that students are less interested in learning mathematics, especially in measurement material. Students feel bored when learning activities in the classroom. Based on this, the value of student learning outcomes at SD Negeri Ngadi is low. Because students are not able to master the material conveyed by the teacher to the maximum.

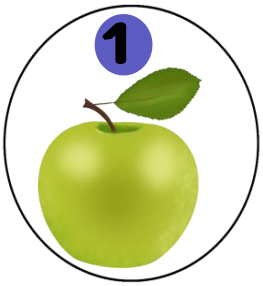
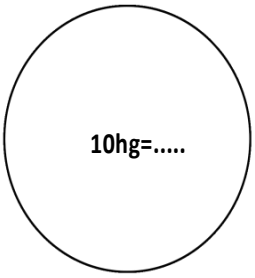
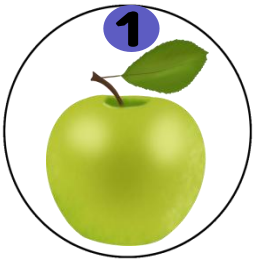
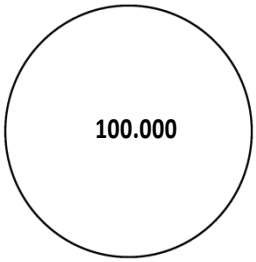
Results of the documentation studies on the test score of class students' learning outcomes grade 3 students of SD Negeri Ngadi on mathematics material for weight units were obtained as many as 88.9% of students were not complete with the average score obtained, namely with a score of 43. In order for students to obtain the information provided by the teacher optimally, learning media is needed that can arouse their curiosity and motivation to learn. Using real media with learning components that are easy to digest and easy to memorize gets students involved in the learning process. Where students can contribute directly in the practice of using media inlearning process. Based on the traditional game Engkelk which is played with units of weight, the researcher will create a fruist game media. Math concepts related to measurement can be better understood and remembered with the use of this media.

3.2 Design (Planning)

After conducting observations, interviews, and documentation, researchers conducted a prototype design of the media to be developed. The initial steps in developing the media are: determining the concept, media display, symbols in the media, material presented in the media, question cards and answer cards in the media, and guidebooks in using the media. In selecting the media design developed by researchers to adjust to the objectives of the research conducted, namely, developing learning media that are interesting, real, and can be used by students. The steps of the planning are as follows:

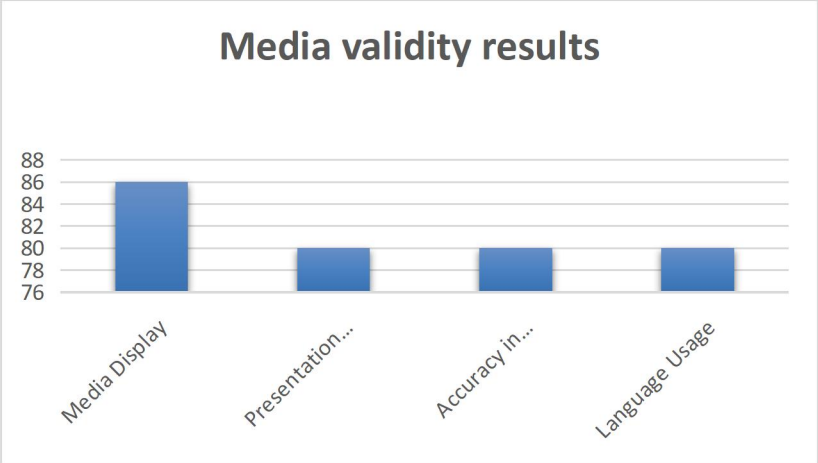
Table 5. Fruits Game Media Design

No.	Media Display	Noted
1.		The design of the fruits gamer media display has one side that contains unit weight material. The media display is also given the identity name of the media. On the circle graph that has been displayed is a place that will be used to put quiz cards and answer cards. The material used to develop this fruits game media is banner paper. The media will be printed on banner paper with a size of 100 x 200 cm.
2.		This fruit-shaped gaco is used to play the fruits game media. As a pointer or marker when students will later get a quiz if the gaco falls in the box that students want.

3.	 Quiz card front view  Quiz card back view  Kartu jawaban Tampak depan  Kartu jawaban tampak belakang	The quiz card contains questions about the material in the learning media. There are 30 quizzes with each front view using different fruit images according to the level of unit weight material. Apple fruit for quiz unit kg, dragon fruit for unit hg, lychee fruit for unit dag, strawberry fruit for unit g, grapes for unit dg, watermelon fruit for unit cg, and banana fruit for unit mg. Likewise, the front view answer card is adjusted to the picture on the quiz card based on the quiz number.
4.	 Instruction card for using fruits game media	The instruction card for using the fruits game media is used as a guide to find out how to play the fruits game media.

3.3 Development

After carrying out the planning stage, the researcher will carry out the media development stage. For the purpose of determining level validity of media produced by researchers, media would be presented to media experts and material experts. In addition, we need to determine whether the materials made are ready for use in educational activities or still need to be refined. Using validation sheets specifically designed for media and materials, experts in both fields will verify the accuracy of the evaluation. To find out if the Fruits Game media is feasible and to get their thoughts on how to make it better, media experts validated it. The media expert validator is a lecturer in the learning media development course. The results of media validation experts can be show in the following diagram:



` **Diagram 1.** Media test results.

The results of mediavalidation expertsshow that in aspect of media display, the overall score is 86%. In the aspect of media presentation standards, the overall score is 80%. In the aspect of accuracy of writing and language used, the score is 80%. And on the ease of use aspect, the score is 80%. Media expert validation resulted in the conclusion that the overall evaluation of media elements was quite valid, with a score of 81%. In addition to the media expert validation test, the media will be validated to the material expert. The material expert who will be the validator of the Fruits Game media is a lecturer in the basic concepts of mathematics course. The following are the results of the material expert validation:

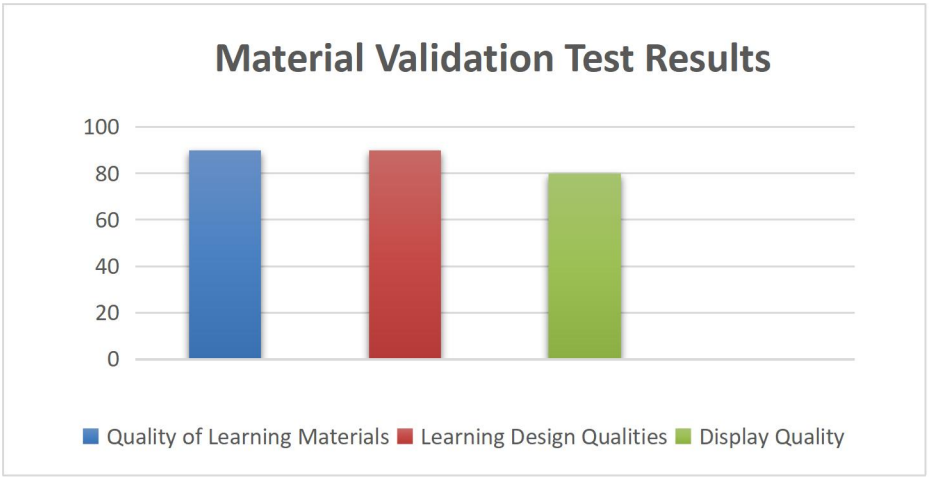


Diagram 2. Material validation results

Based on the results of the material validation experts, the aspects assessed are: the quality of teaching materials (90%), the quality of learning design (90%), and quality of material presentation (80%). Expert validation on materials and media resulted in the conclusion that these factors were generally valid, with an overall score of 87%. Experts in the field of media and materials validated the fruit game media, and their verdict was that the media was highly valid and suitable for use in an educational setting.

3.4 Implementation

After knowing the feasibility of media, the following step is the implementation of the media. In this study, two trials were conducted using media that had been verified by experts in their fields and experts in the media field, so that the media could be used in learning activities with confidence. A total of seven students became the

initial trial group. This was done to find out whether the Fruits Game media was practical and could attract students' interest or not before this media was widely tested. The broad test was conducted on 20 students. Where each student before using the media will be given a pree test question and after using the media. Students will be given a post test question, and students will fill out a student response questionnaire that has been given. The following are the results of the media practicality test by the teacher as follows:

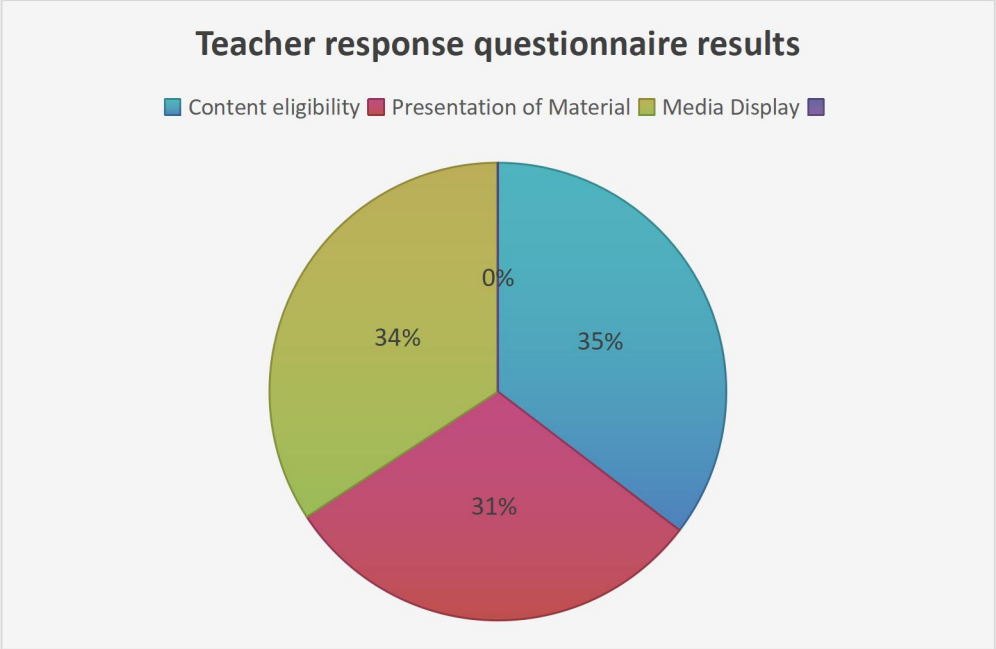


Diagram 3. Practicality test results

Based on the diagram above, the percentage of media practicality results is obtained. In addition to the media practicality test questionnaire given to the teacher, a student response questionnaire was also given to find out the practicality of the media that had been developed. The following is a diagram of the results of the student response questionnaire, namely:

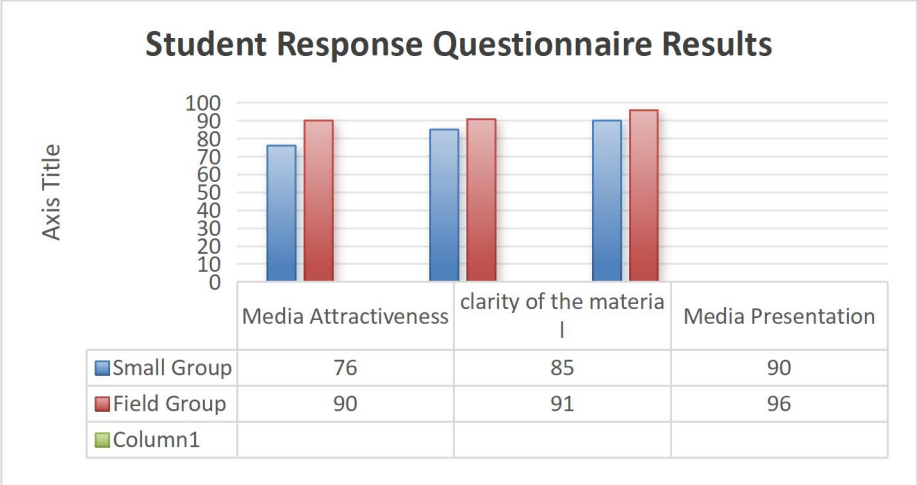


Diagram 4. Practicality results by students

Based on the results of the student and teacher response questionnaires, the practicality value of the media is 85.7% categorized as very practical when conducted small group trials, 84.3% categorized as very practical when conducted field group trials. As well as the practicality value obtained from the teacher response questionnaire with a percentage of 96% which is categorized into very practical. From the results of this explanation, the Fruits game media is said to be very practical after being tested on students through 2 trials.

3.5 Evaluate (Evaluation)

In the evaluation stage, observations are made when the application of the media takes place during learning activities and the results of the assessment of the developed media. There are two parts to the assessment process in this study: formative and summative. To find out how feasible and quality the material created is, a formative assessment is carried out. As well as summative evaluation seen when implementing media tests in the field, the response of grade 3 students of SD Negeri Ngadi was very enthusiastic and excited when the media trial activities took place. Students are interested in trying Fruits Game media to solve unit weight material. In the summative evaluation, pre-test and posttest questions were also given to students.

3.5.1 Media Feasibility

Experts in the field of media and materials validated the Fruits Game learning media, and the results showed that the media was suitable for use. The results showed that the media expert validation had a success rate of 81%, and the material expert validation had a success rate of 87%, both classified as highly valid. The findings of the Fruits Game media validation show the potential of the media to be applied in education.

3.5.2 Media Practicality

The practicality of the Fruits Game media was measured using a questionnaire distributing teacher responses and student responses. The distribution of student response questionnaires in the small group test with 7 students obtained a percentage of 85.7%, the percentage in the field group test with 20 students obtained a percentage of 84.3% and was categorized as very practical. The practicality of the media was also given a teacher response questionnaire with a percentage of 96% which was categorized as very practical. Based on the results of the student and teacher response questionnaires, the Fruits Game media is categorized as very practical and very helpful for 3rd grade students of SD Negeri Ngadi in learning activities on unit weight material.

3.5.3 Media Effectiveness

Media effectiveness is obtained from the results of the pree test and post test given to students. Before giving treatment, researchers gave pre-test questions to a small group of 7 students and to a field group of 20 students. The following are the results of the pretest and post test of the small group and field group tests. The value of the pre-test and posttest results will be tested using the t-test on SPSS version 16, this is done to determine the difference before using the media and after using the media. The following is the t-test result data:

Tabel 6. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preetest	53.4000	20	33.49847	7.49049
	Posttest	82.8000	20	18.76615	4.19624

Based on table 4 after conducting a t-test of the pretest and posttest values, the average pretest value was 53.4 and the average posttest value was 82 with a total of 20 students. The following is a table of t-test results to measure the effectiveness of the Fruits Game media:

Tabel 7. Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Preetest - Posttest	-2.94000E1	28.23287	6.31306	-42.61339	-16.18661	-4.657	19	.000

To determine if there was an impact on the use of GASPAT media during math learning, a t-test was conducted using the pre-test and post-test results to assess media efficacy. A significance level of 0.056 was achieved from the hypothesis test using the t-test in SPSS with paired sample t-test output. We reject Ho and accept Ha when the two-sided Sig value is less than 0.05 (0.000 < 0.05). Based on the premise of decision making, we can conclude that Ha is accepted and Ho is rejected. This means that there is a significant difference between the pre- and post-GASPAT math learning outcomes for the topic of measuring length and weight. This finding suggests that third grade students of SD Negeri 1 Bulu can benefit from using GASPAT learning media to improve their math understanding and ability.

IV. CONCLUSION

It is clear from the findings and conversation that learning media is very important for students and educators. The Fruit Game Media can help enhance student learning outcomes, according to the study on its creation. Experts in the field of media obtained 81% media validity findings, while experts in the field of material obtained 87%. Practicality by students obtained a percentage of 85.7% and 84.3%, the results of practicality by teachers obtained a percentage of 96%. In the same way, the paired sample t-test yielded a Sig (2-tailed) value of 0.000, which was used to derive media efficacy findings from the pre-test and post-test scores. We reject Ho and accept Ha when the two-tailed Sig value is less than 0.05 (0.000 < 0.05). Based on the reasoning behind the choice, it can be concluded that the math learning outcomes for the topic of weight measurement are significantly different before and after the use of fruits game learning media. With these results, the use of Fuits Game learning media is effective to use and improve Mathematics learning outcomes of third grade students of Ngadi Elementary School.

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