



Pengembangan Lembar Kerja Siswa Terintegrasi Trik Jitu Perkalian Susun Peserta Didik Kelas III SD

Development of Integrated Student Worksheets Stacking Multiplication Tricks Class III Elementary Students

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Abstract

Article research on the development of the right trick LKS was made to determine the prototype of the development of the LKS, to find out the validity of the development of the right trick LKS in stacking multiplication material, and to measure the effectiveness of the stacking multiplication skill worksheet in grade III students at SDN 50 Bulu Datu Palopo. This research method is the method of research & development (R&D). The development model used in this development is the four. D model, but this study only performs the 3D stages, namely define, design, develop. The subjects in this study were class III.B SDN Bulu Datu Palopo totaling 24 students. The data collection techniques in this study used observation, tests, documentation, interviews, and questionnaires. Based on the needs analysis shows that in learning mathematics multiplication stacking requires a teaching material in the form of stacked multiplication worksheets. Data analysis techniques to test the effectiveness using the T-test and to test the validity using Aiken's formula. The results of this study indicate that the development of the stacking multiplication trick worksheet developed was declared valid by the three validators with a recapitulation of the value of 0.67. The precise trick LKS teaching materials are categorized as effective based on the results of the T-test and the pre-test and post-test results.

Keywords: LKS; Multiplication Stacking; The Right Trick

Abstrak

Article penelitian pengembangan LKS trik jitu yang dibuat untuk mengetahui prototipe pengembangan LKS, mengetahui kevalidan pengembangan LKS trik jitu dalam materi perkalian susun dan mengukur keefektifan LKS trik jitu perkalian susun pada peserta didik kelas III diSDN 50 Bulu Datu Palopo. Metode penelitian ini adalah metode research & development (R&D). Model pengembangan yang digunakan dalam pengembangan ini adalah model four. D namun dalam penelitian ini hanya melakukan tahapan 3D yaitu define (pendefinisian), design (perancangan), develop (pengembangan). Subjek dalam penelitian ini adalah kelas III.B SDN Bulu Datu palopo berjumlah 24 peserta didik. Adapun teknik pengumpulan data dalam penelitian ini menggunakan observasi, tes, dokumentasi, wawancara, dan angket. Berdasarkan analisis kebutuhan menunjukkan bahwa dalam pembelajaran matematika perkalian susun dibutuhkan sebuah bahan ajar berupa LKS perkalian susun. Teknik

analisis data untuk menguji keefektifan menggunakan uji T dan untuk menguji kevalidan menggunakan rumus Aiken's. Hasil penelitian ini menunjukkan bahwa pengembangan LKS trik jitu perkalian susun yang dikembangkan dinyatakan valid oleh ketiga validator dengan hasil rekapitulasi nilai 0,67. Bahan ajar LKS trik jitu dikategorikan efektif berdasarkan hasil uji T dan uji coba pre tes dan pos tes.

Kata Kunci: LKS; Perkalian Susun; Trik Jitu

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Introduction

One of the factors that can support the success of education is that an educator/teacher is able to produce teaching materials that can be used in learning to achieve learning objectives. Prastowo stated that teaching materials, both in the form of information, tools, and text that are systematically arranged that can be used by students in the learning process with the aim of planning and reviewing the implementation of learning, for example, study books, modules, handouts, worksheets, audio teaching materials and so on (Andi Prastowo, 2013).

LKS teaching materials are teaching materials that can support the process of teaching and learning activities in the world of education (Fannie and Rohati, 2014). LKS is also a teaching material that is simpler and more practical for learning. According to Trianto, student worksheets are student guides used to carry out investigative and problem-solving activities in learning (Effendi and Aini, 2018). LKS is a teaching material that can increase students' knowledge and improve learning outcomes so that learning objectives can be achieved in line with Andi Prastowo's opinion that one of the LKS functions is as a teaching material that makes it easier for students to understand the material provided.

Based on the results of preliminary observations, researchers on Friday, March 15 2019 at SDN 50 Bulu Datu in the mathematics learning process of stacking multiplication material in class III.B, where the teacher only uses the 2013 curriculum book as a personal guide in learning besides that students only get material explanations through what the teacher writes on the blackboard so that it makes students confused, bored and doesn't understand the lesson.

In line with the analysis conducted by researchers on grade III.B students, which showed that 20% of students who understood stacked multiplication material, 30% did not understand, and 50% did not understand stacking multiplication material.

Therefore, the researcher intends to develop teaching material in the form of worksheets for stacking multiplication tricks because worksheets are sheets containing instructions and steps in completing assignments with short and clear explanations (Lestari and Afifah, 2012). Focuses this research on stacked multiplication material, consisting of multiplication in long and short multiplication ending with addition. In addition to doing basic multiplication, students are required to understand the stages of placing the position of each digit in each number then ending with the stacking addition process (Nursalam, 2016).

The development of LKS is the development of teaching materials that have been developed before or not for the first time, there are several LKS developments which previously included research from Musnidatul Millah Arief, Chusnal Ainy, Wahyuni Suryaningtyas with the title Development of Student Worksheet (LKS) Mathematics for Class VIII Prism Material with a Scientific Approach At SMP Dr. Soetomo Surabaya has shortcomings such as worksheets which are made very obliging students to be able to fully understand learning with material that is considered difficult for some students to understand (Arief et al, 2016). Research from Rizky Dezricha Fannie, Rohati with the title POE-Based Student Worksheet Development (Predict, Observe, Explain) in Class XII Linear Program Material (Fannie and Rohati 2014). It has shortcomings in the research base raised, this is because the POE basis has fairly long and time-consuming stages.

Rifdatur Rahmi, Sri Hartini, Mustika Wati with the title Development of Student Worksheets (LKS) Based on Guided Inquiry and Multimedia for Junior High School Science Learning (Rahmi et al, 2014). It has shortcomings in the teaching materials developed because not all schools can apply the teaching materials because to use these teaching materials, LCDs need to be prepared, and adequate networks to be able to make the teaching materials as useful as they should be.

Based on the research and development of previous student worksheets, from that, the researchers developed the integrated LKS teaching materials with accurate tricks focusing on stacking multiplication materials, which focused on third grade students of SDN 50 Bulu Datu. The parts contained in the LKS are an explanation of the multiplication stacking material in detail, examples of questions and explanations. In addition, this worksheet is well designed so that it can be easily understood by third

grade elementary school students and does not make it difficult for teachers because the worksheets can be used anywhere or in any condition.

Method

This type of research is development research (Research and Development) (Sugiyono 2016). This research will develop a worksheet in which there are quick ways to answer material related to stacking multiplication. This study followed the 4D model developed by Thiagarajad (Dewi et al, 2013). Which goes through the stage of the definition stage (define), the design stage (design), the development stage (develop), the dissemination stage. The defining stages analyzed were (1) front-end analysis, (2) student analysis, (3) concept analysis, (4) task analysis, (5) designing learning objectives. The research subjects of Class III.B students consisted of 24 people, analysis of instrument needs, namely documentation, tests, observation, documentation, and questionnaires.

To test the validity of student worksheets, it is necessary to use the Aiken formula developed by (Sudi el al,2017). Meanwhile, the effectiveness test measures by comparing the value of learning outcomes before the test, post-test, and T-test comparison. The T-test is used to see the effect of each independent variable (Setiawan et al. 2017). So that the effectiveness of the precise trick worksheets developed by researchers is stronger. The first treatment data in this study was determined through the pretest result value and the second data was determined through the post-test result value (Montolalu and Langi, 2018). The data is in accordance with the results of comparisons obtained through the experiment before (pre-test) and after (post-test) in pairs using the T-test formula.

Result

The analysis of student worksheets needs is integrated into the right tricks on stacking multiplication learning.

This research begins with the analysis stage to determine the need for student worksheets, the analysis begins with the front end analysis at front end analysis stage. The researcher found several problems in SDN 50 Bulu Datu class III.B in stacking exercises. Based on the front-end analysis, the researchers found many things ranging

from a comfortable classroom atmosphere to problems experienced by students such as the teaching materials used by the teacher.

Where the teacher only uses the K13 handbook which is only owned by the teacher, regarding the explanation given by the teacher which makes students less understanding due to complicated explanations. Based on this needs analysis, the researcher concluded that about 80% of students were nervous and had difficulty doing stacked multiplication because students did not understand the learning being taught.

Based on the results of interviews sourced from students, it was stated that stacking multiplication learning was a difficult subject matter, long completion steps, and not all students memorized and understood multiplication. Based on the results of the questionnaire sourced from the educator (teacher), write and provide an explanation of the general description of the student's character, the explanation of the multiplication stacking material, and the classroom atmosphere during the learning process.

Early prototypes of integrated LKS product development. The right trick is learning multiplication stacking

At the stage of designing a product, there are several things that have been prepared by the researcher, to design a teaching material in the form of a student worksheet (student worksheet) that can make it easier for students to understand the multiplication stacking method. As for the things that need to be prepared by the researcher first, starting with the making of the cover of the right trick worksheets, which is the initial part in the development of the stacking multiplication accurate trick worksheets. according to the material developed and the provision of colors suitable for the character of the students and the pictures given according to their age.



Figure 2 The cover of the Perfect Tricks Worksheet

Based on the contents of the LKS, the researcher entered stacking multiplication material starting from short multiplication to long multiplication included with questions and solutions and continued with the introduction of stacked multiplication tricks that combined long and short multiplication into one solution that made it easier for students to understand the material multiplication faster and more practical. Worksheets with stacking multiplication tricks are made more interesting by adding pictures that can develop students' motivation to read and learn.

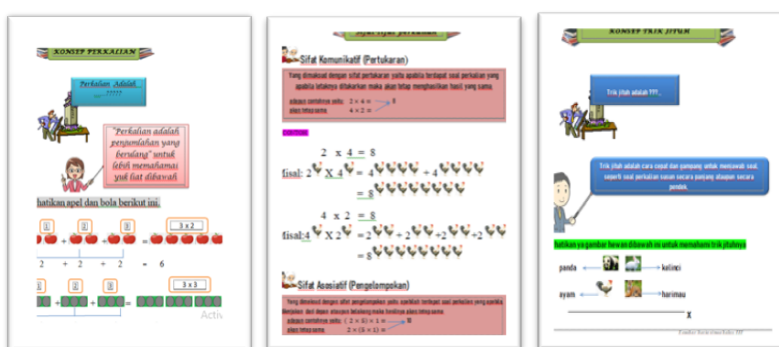


Figure 3 The cover of the Perfect Tricks Worksheet

The stages of developing the worksheets that are made must pass the validation stage carried out by severe experts in accordance with the teaching materials developed by the researcher.

The validity and effectiveness of integrated worksheets. The right trick is learning Multiplication Stacking.

The validity results of the right trick worksheets on stacking multiplication material based on expert validation according to the validation field of expertise obtained the validity of the learning outcome test 0.79-1.00, the validity of the right trick worksheets from 0.78 to 1.00, and the validity of observing student activities during the learning process stacking multiplication from 0.67 to 1.00. Thus, the right trick worksheets are included in the valid category. The results of the validity of the right trick worksheets based on expert validation values. Based on the table regarding the validity of the right trick worksheets, seen from the results of the scores given by the three validators processed using Aiken's formula. So it can be concluded that the right trick worksheets have been classified in the valid category

Table 1. Recapitulation of Expert Validation Results of Expert Tricks

Aspects assessed	Criteria	$\frac{\sum s}{[n(c-1)]}$	Information
Expert Validation Results	Learning Outcomes Test	0,78-1,00	Valid
	Student Worksheet (LKS)	0,78-1,00	Valid
	Observation of Stacked	0,67-1,00	Valid
Perfect Trick Worksheets	Multiplication Learning		

In the Paired Samples Statistics table which shows the average value between the pre-test and the post-test that has been given to students, besides that in the table, it is clear that the comparison and difference in values obtained by students shows the comparison between the pre-test and post-test seen in the following table.

Table 2. Paired Samples Statistics

		Mean		Std.	Std. Error Mean
		N		Deviation	
Pair 1	pre test	64.800	25	9.62635	1.92527
	post test	74.600	25	7.89515	1.57903
		0			

The results of the effectiveness of precise trick worksheets for stacking multiplication materials using tests on grade III.B students of SDN 50 Bulu Datu. By using the right trick worksheets, the average pre-test and post-test learning outcomes increased by 64,000 and 74,000 in the post-test. Thus, precise trick worksheets are effective and suitable for use in mathematics learning stacking multiplication material because it can help increase the value of student learning outcomes in stacked multiplication material. The results of the following paired sample statistics. In this output it is shown that a series of descriptive statistics of the two data. The data mean value (average value) of pre-test was 64.8000 and post-test was 74.6000 with 25 students. It can be seen that the post-test score is higher than the pre-test (64.8000 < 74.6000).

In the table Paired samples test in which the average value of the pre-test and post-test is presented, which shows the level of independence found in the two tests that have been carried out. So that it can be concluded whether the two stages of the test that have been carried out can be said to be reached in what number range, halite can be seen in the Paired Sample Test Table.

Table 3. *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 pre test - post test	-9.80000	5.09902	1.01980	-7.69523 11.9047	-9.610	24	.000

The mean value obtained from the pre-test and post-test independence was $68.8000 - 74.6000 = -9.80000$, the standard deviation between pre-test and post-test was 5.09902 , the interval for the difference in independence was at the 95% confidence level.

Discussion

This research developed the teaching materials for the precise trick LKS learning multiplication stacking mathematics. This worksheet contains practical instructions, experiments that can be done at home, material for discussion, and practice questions, as well as any instructions that can encourage students to be active in the learning process (Hendro Darmodjo Dan Jenny R. E. Kaligis, 1999).

As explained (Trianto novisa , 2014) which states that LKS is a guide for students to carry out investigative or problem-solving activities.

The analysis of student worksheets needs is integrated in the right tricks on stacking multiplication learning.

Development of worksheets by adapting the steps for developing learning packages such as modules (B.suryobroto, 1986). As for the steps in developing the right trick worksheet, it refers to the 4D model stages that begin with a needs analysis. A

needs analysis is carried out to find out what was the initial problem for researchers to develop an accurate trick worksheet, such as the material to be developed (Jarlah 2011).

The stages in the analysis of the needs for developing worksheets

1. Establish competency standards and learning objectives (basic competencies)
2. Describe basic competencies into indicators
3. Establish procedures in the development of the right trick worksheets
4. Develop a complete worksheet based on the results of the resulting needs analysis (Salirawati, M, 2004).

In addition to obtaining the stages of developing the right trick worksheet. Needs analysis is also needed to determine the cause of the low intellectual ability of students in understanding stacked multiplication material. As stated by Gagne, learning, and thinking are in a series of cognitive work with the mastery of a number of initial knowledge (Yusup, 2010). Then the students' abilities can be seen from the basic abilities they have.

The techniques used to conduct needs analysis are by conducting interviews with students and teacher questionnaires. As for the problem, researchers developed worksheets with stacking multiplication tricks in grade III elementary school students, because during the learning process of stacking multiplication students did not have their own handbooks so that students looked confused because students only heard material explanations from the teacher's explanations without any books for students.

The subject of multiplication is a material that is difficult for students to understand at the basic level. Difficulties will continue when they are then faced with more complex calculation problems (Norsanty and Chairani, 2016). So that the teacher needs to provide an explanation and a method that is easily accepted by students regarding stacked multiplication material. LKS is a student guide that is used to carry out investigative activities or problem-solving (Trianto, 2012). Student and teacher worksheets can make it easier to achieve the learning objectives to be achieved.

Stages of integrated student worksheets product development The right trick in learning multiplication stacking

Stages of developing and designing the right trick worksheets. The design/design of the right trick worksheets for stacking multiplication follows the 4-D model's development design which includes several stages that need to be done, namely defining, designing, and developing (Lestari and Afifah n.d.). Preparation of

worksheets that construct knowledge, interests, and in accordance with the material and characteristics of students, so that they are interested in learning mathematics activities (Effendi and Aini 2018). Each preparation and development of accurate trick worksheets are tailored to the characters possessed by the students.

The initial stages of developing an effective trick worksheet

1. Noting the differences in each student
2. Can develop social, emotional, moral, and aesthetic skills in students
3. Can make it easier to understand stacking multiplication material.

In addition, in developing student worksheets, researchers must pay attention to the use of language that is suitable for students and clear sentence structures (Effendi and Aini 2018). So that students can easily understand every explanation that is contained in the stacking multiplication accurate trick worksheets (Rupa and Tias 2014). So that the teaching materials in the form of worksheets can be used as their function.

Test the effectiveness and validity of integrated worksheets Right tricks in learning multiplication stacking

The worksheets that have been developed can be used in the learning process through validity stages. Validity is carried out to determine the feasibility level of the LKS. This opinion is also in line with the opinion (Fannie and Rohati 2014). Design validation is a product design assessment process that is carried out by giving worksheets to several experts to see the results of the feasibility of the LKS products made so that shortcomings and weaknesses can be identified. Every suggestion given by an expert validator is used as a guide in revising student worksheets.

Teaching materials in the form of student worksheets can be said to be valid if the worksheets have met the validity stage to see to what extent these worksheets can be used to achieve predetermined learning objectives (Ahmad Muhammad, 2005). This assessment was carried out to see the feasibility of the worksheets to be used as teaching materials for learning Mathematics for stacking multiplication materials. As for the LKS feasibility assessment according to T. Raka Joni. (1983) ie

1. Appearance/design
2. Language/clarity of the message content of each explanation in the right trick worksheets

3. Application/aim to determine the role and influence of the right trick worksheets in the learning process of stacking multiplication materials (Salirawati and Si, 2004).

The level of validity of teaching materials is said to be invalid if they get a range of values from 0.00 to 0.60, while teaching materials that get a value of 0.61-1.00 are in the valid category. And for the stacking multiplication worksheets developed by the researcher by passing the assessment of three expert experts according to their expertise, then the right trick worksheets can be categorized as valid by showing a validity value of 0.67-1.00 from the numbers given by the validator of the right trick worksheets entered in. The category is valid and can be tested, and applied in the classroom to then measure its effectiveness.

The precise trick worksheets developed by researchers will be tested to see their effectiveness. This is in accordance with the opinion (Efektif et al, 2015) which states that to see the effectiveness of teaching material, a trial is conducted. Through the analysis of the effectiveness test data using the comparison of pre-test and post-test and through the stages of statistical testing, the value of $64.8000 < 74.6000$ was obtained. In addition, the learning outcomes obtained by students had increased after using precise trick worksheets. This is in line with the statement (Agus Suranto, 2012) concluded that the hypothesis which states that there is an effect of using worksheets in learning because the level of effectiveness is stated to be very effective in line with the assumptions and journals (Irawan 2016). Learning outcomes are obtained from the learning process that has been carried out using the developed LKS teaching materials.

Conclusion

The development of accurate trick worksheets is based on the needs of students and educators in helping to understand multiplication material, especially stacking multiplication, which most students have difficulty in teaching each stage of its completion, in addition to providing convenience to educators in explaining the material. To find out that all researchers used interviews for students and questionnaires for educators. The development of integrated worksheets with tricks focused on stacking multiplication material is made to help students understand stacking multiplication material easily, the development of these worksheets is

arranged based on the 4.D model which goes through several stages starting from define, design, and development.

The development of the right trick worksheets developed by researchers can be used as a guide for students and educators in the learning process, especially stacking multiplication material, before using the LKS has passed validation and effectiveness tests. The following results from the recapitulation of the LKS validation results can be obtained a value of 0.67-1.00 so that when viewed from the aspect of the value listed it shows that the developed student worksheet is in the valid category, while for the effectiveness of the stacking multiplication trick worksheet using the pre-test comparison. and the pots test and strengthened by the T-test, the post-test scores were higher than the pre-test ($64.8000 < 74.6000$). This indicates that the developed worksheets have been effective.

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