Contextual-Based Student Work Sheet Development in Mathematics Class IV at SD Negeri 206 Simpang Nibung

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Abstract

This study aims to develop teaching material products in the form of Contextual-Based Student Worksheets in Mathematics Class IV SD Negeri 206 Simpang Nibung which are valid and practical to use in the learning process. The research method is R&D (Research and Development), using the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). Data collection techniques used are observation, interviews and questionnaires. Data analysis techniques using a scalelikert and scalegutman. The results of the research based on the analysis of the linguist's assessment showed 0.80 and the validation results of media experts were 0.78 and the results of material validation were 0.85. Overall the results of the analysis and calculation of the value of the questionnaire from the team of experts, contextually based Student Worksheets fall into the high category with a percentage of 0.81. While the results of the teacher practicality test are classified as very practical and the results of the trialsone to one classified as very practical as well as the results of trialssmall group very practical. The overall results of the practicality test are in the very practical category with a percentage of 87.6% so that it can be concluded that contextually based Student Worksheets in Mathematics are valid and practical to use.

Keywords – Development; Student Worksheets; Contextual, Mathematics

1. Introduction

Learning is an activity that is characterized by a change in a person. Changes as a result of learning activities can be shown in various forms such as changes in knowledge, understanding, attitudes and behavior, skills, abilities, customs and changes in other aspects that exist in individuals who learn. Setiawati (2018:32) learning can bring a change to individuals who learn. This change is not only related to the addition of knowledge, but also forms of skills, understanding, attitudes, self-esteem, interests, character and self-adjustment. Success in learning activities can be seen through the level of success in achieving learning objectives.

Learning is a process of interaction between educators and students that takes place in a learning environment, Thobroni (Rahayu et al, 2021:66). Parmiti (Tarigan et al, 2019: 180) learning is a system that has learning parts including: students, educators, graduates with the desired competencies, learning processes, curriculum and learning materials. These parts must be interconnected and unite to form a single function in achieving the goal. All parts need attention. If one of the parts does not blend properly, the learning objectives are not optimally achieved. In order for learning objectives to be achieved optimally, an educator must strive to educate or present interesting learning materials so that students can understand learning materials and learning concepts. Learning materials are materials used by educators in carrying out teaching and learning activities in class. One of the learning materials taught by educators is mathematics.

Mathematics is one of the subjects in the education curriculum in Indonesia as a compulsory subject. It is on this basis that mathematics must be taught both in formal learning and informal learning (Dwirahayu et al, 2017: 117). Aswarliansyah (2020: 1135) learning mathematics is a process of learning activities created by teachers to foster the creativity of students who can improve thinking skills, argue, and provide dedication to handling problems in everyday life. In view of the importance of mastering mathematics in improving the quality

of human resources and its benefits in everyday life, it is only natural that since elementary school mathematics was introduced.

Learning mathematics at the SD/MI level is a basic understanding given, therefore, appropriate learning of mathematical concepts must be understood by students as a basic understanding to continue to a higher level. Mathematics is taught to students from simple things to more difficult problems with the aim that they can understand the concept of problem solving and arithmetic skills as a basis in practice. In fact complaints and disappointment with the results achieved by students in mathematics until now are often expressed. Mathematics is recognized as a subject that is considered difficult and stressful. It is the task of the mathematics teacher to change people's perceptions of mathematics.

Based on the results of interviews conducted at SD Negeri 206 Simpang Nibung with Mr. Candra Gunawan, S.Pd. as a class IV teacher at SD Negeri 206 Simpang Nibung, there are still several obstacles such as the supporting materials used to carry out the learning process, teachers and students only use one learning resource book, namely a textbook. Furthermore, the activities carried out by the teacher still do not use student worksheets (LKS), teachers often apply a lecture system and write questions on the blackboard which are then recorded and answered by students in notebooks and teachers also do not take advantage of learning with the surrounding environment. This makes students not motivated to study and solve problems, this can be seen from student learning outcomes, especially in learning mathematics. The results of the needs analysis given to fourth grade students at SD Negeri 206 Simpang Nibung show that many students have difficulty understanding mathematics subject matter due to a lack of learning resource books. To be able to help students understand the subject matter, a supporting book is needed. The supporting book can be in the form of student worksheets.

Student worksheets are an appropriate learning alternative for students because student worksheets help students to increase information about the theory learned with structured learning activities, Suyitno (Fannie & Rohati, 2014:

98). According to Tarigan et al (2019: 180) student worksheets are sheets of paper containing assignments that need to be completed by students. The existence of LKS has had a significant impact on the implementation of teaching and learning activities. LKS is a tool to help and facilitate learning activities, so that effective interactions are formed between educators and students. Student worksheets are made to provide direction for students so they can understand a learning topic or problem. The LKS used must use an approach to be effective and efficient and able to answer students' needs in understanding a learning material. There are many approaches that can be applied to worksheets, but one approach that is suitable for worksheets is the contextual approach.

The contextual approach is intended to provide understanding to students so they can find links between the material being studied and real life situations. Furthermore, encouraging students to be able to apply it in everyday life. According to Aswarliansyah (2020: 1336) contextual learning is learning that is directly related to the daily lives of students, it will definitely be fun and easy to understand for students. Therefore, contextually based student worksheets are very suitable to be created as supporting books, especially in learning mathematics because they provide activities that encourage students to relate the material being studied to everyday life. Learning resources such as worksheets are an important component in determining the quality of learning. Learning resource development design must look at the development model to consider the quality of learning resources in supporting learning effectiveness. One development model that can be used is ADDIE through five stages;Analysis-Desain-Development-Implementation-Evaluation. According to Cahyadi (2019: 35) the ADDIE model is one of the lesson system designs that shows the basic level of a learning system that is easy to implement.

Based on the problems above, the researcher is interested in developing a learning resource, namely contextual-based student worksheets in mathematics that are designed as attractively as possible to be a support to help students understand the material provided, encourage students to be more

interested and active and be able to solve difficult problems in learning. Making student worksheets with a contextual approach to mathematics is necessary to bridge and guide students to understand real concepts, facts and principles. Therefore, researchers are interested in conducting development research with the title "Development of Contextual-Based Student Worksheets in Mathematics Class IV SD Negeri 206 Simpang Nibung.

2. Method

This research uses the type of development research. According to Hamzah (2020:1) development research (R&D) is research that is used to produce or test the effectiveness of the product being developed. The development model used in this study is the ADDIE model, the ADDIE model consists of 5 stages namelyAnalysis, Design, Development, Implementation andEvaluation. This development model is used to develop contextual-based student worksheets as supporting teaching materials in learning. The following is the design and development of student worksheets using the ADDIE model :

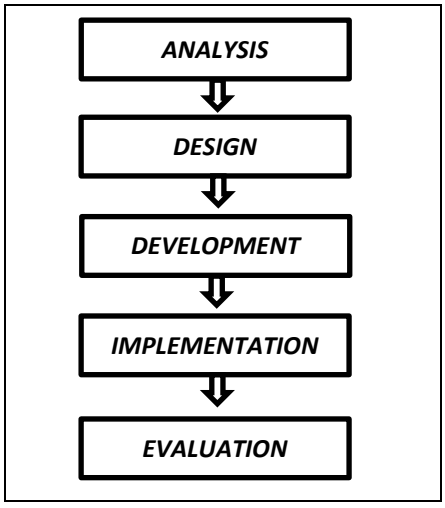

Figure 1. Development steps according to Cahyadi (2019:42)

Level Analysis is the stage where the researcher analyzes needs, identifies problems, and performs task analysis.Design (Design) is the product design activity according to the needs.Development (Development) is the activity of making or testing a product. After the product is made, a validation test will be carried out by three experts, namely linguists, media and material

experts.Implementation (Implementation) is an activity using a product or concrete steps to implement the learning system that is created.Evaluation (Evaluation) is an activity to assess whether each step of the activity or product made is in accordance with predetermined specifications, Hamzah (2020:33).

The test subjects in this study were experts/experts and students and teachers of class IV SD Negeri 206 Simpang Nibung. Data collection techniques used in this study are observation, interviews and questionnaires. At the time of observation the researcher observed the learning activities carried out by the teacher and students to obtain information about the state of the teacher and students in the learning process. Interviews were conducted with teachers and grade IV students at SD Negeri 206 Simpang Nibung to gather information about the difficult situations experienced by teachers and students in the implementation of learning. In this study the questionnaire used was a questionnaire for experts and a practicality questionnaire for teachers and students. Furthermore, data analysis techniques use a scaleLikert and scale Guttman.

In this study, data analysis techniques included validity and practicality tests. Validity test is used to determine the quality of the product being developed. In this study, validation was carried out by linguists, material experts and media experts. The validator analyzes the development of contextually-based student worksheet products. The data obtained from linguists, material experts and media experts on the assessment sheets will be used to determine the validity of the student worksheets. Data the validity assessment sheet Student Worksheet obtained by steps as follows:

a. Giving a score for each item with the answers strongly agree (5), agree (4), enough (3), disagree (2) and strongly disagree (1) for positive and strongly statements agree (1), agree (2), enough (3), disagree (4) and strongly disagree (5) for negative statement.

b. Giving a validation value with the following formula:

$$V = \sum S/[n.(c-1)]$$

Azwar (Lestari et al, 2020:260)

Information:
S= r-lo
lo= The lowest validity rating score (in this case = 1)
C= The highest validity rating score (in this case = 5)
r= The number given by an appraiser
n= Number of validators

c. Matching the average validity with the validity criteria of contextually based student worksheets.

Table 1. Interpretation of validity Aiken's V

Correlation coefficient	Validity Interpretation
> 0,80	Height
0,60 ≤ V < 0,80	High enough
0,40 ≤ V < 0,60	Enough
0 ≤ V < 0,40	Bad

Source : Febriandi et al., (2019:152)

According to Marimin & Maghfiroh (2011: 49) the measurement process is said to be practical if the measurement is economical, easy to use, and easy to understand. The practicality of contextually based Student Worksheets (LKS) in mathematics lessons can be seen from the assessment of student and teacher practicality sheets in the following way:

a. he student response questionnaire is given a score for each item with the answers "Yes" (1) and "No" (0) for positive statements and "No" (1) and "Yes" (0) for negative statements, while the teacher's response questionnaire scored strongly agree (4), agree (3), disagree (2), strongly disagree (1) for positive statements and strongly agree (1), agree (2), disagree (3), strongly disagree (4) for negative statements.

b. Giving a practical value with the formula:

$$\text{Practicality level} = \frac{\textit{Total score obtained}}{\textit{Maximum number of scores}} \times 100$$

Source: Hidayat (Lestari et al, 2020:261)

c. Matching the practicality average with the practicality criteria of contextually based Student Worksheets.

Table 2. Interpretation of practicality data

Percentage (%)	Category
81% - 100%	Very Practical
61% - 80%	Practical
41% - 60%	Quite Practical
21% - 40%	Less Practical
0% - 20%	Impractical

Source: Irsalina & Dwiningsih (Azzahra et al, 2020:107)

3. Result and Discussion

This research produced a product, namely contextual-based Student Worksheets in Mathematics class IV Elementary School which has been validated and tested and improved according to the input and suggestions that have been given. The research was conducted at SD Negeri 206 Simpang Nibung with class IV student and teacher respondents. The research was carried out in accordance with the stages of development research using the ADDIE model, namelyAnalyze (Analysis),Design (Design),Development (Development),Implementation (Implementation), andEvaluation (Evaluation) which aims to produce a valid and practical Student Worksheet (LKS). The following is an explanation of the stages that have been carried out in the development of contextual-based Student Worksheets:

Level Analysis is the initial stage for conducting development research. At the analysis stage, the researcher analyzes the performance and needs of students to obtain the necessary information. Performance analysis was carried out by direct observation of the homeroom teacher of class IV SD Negeri 206 Simpang Nibung. Based on the results of the interview submitted by Mr. Candra Gunawan, S.Pd. that in the learning process the teacher only uses one learning resource book, namely a textbook. Problems related to this also cause a lack of student interest in learning the material and students have difficulty understanding what they have learned. Based on the results of the analysis of

student needs it is known that in the learning process students only use one textbook as a learning resource. The impact of this is that many students have difficulty understanding the subject matter. Therefore, SD Negeri 206 Simpang Nibung is suitable to be a place for research on the development of contextual-based student worksheets carried out by researchers.

Level Design is the manufacture of products according to the needs of teachers and students. The designs carried out by researchers are: a) Finding the subject matter to be studied based on the basic competencies used, b) Collecting and summarizing material that is in accordance with basic competencies from various sources, c) Formulating indicators and learning objectives, d) Making sheet cover designs Contextual-based Student Work, e) Designing Contextual-based Student Worksheets, f) Designing instruments to be used in development research, namely evaluation sheets for validating linguists, media and materials and evaluation sheets for teacher practicality questionnaires and students, g) Instruments that have been designed are then evaluated.

Level Development is to produce contextually-based Student Worksheets products as teaching materials for class IV elementary school students who are valid. This stage is carried out by providing validation questionnaire products and instruments to 3 experts as language, media and material validators to obtain input and suggestions. in the opinion of Sugiyono (2016: 414) that product validation can be carried out by several experienced experts to assess the new product that has been designed so that the weaknesses and advantages of the product can then be identified. The assessment results of the three validators were analyzed using a formulaAiken's V to determine the validity of the contextually-based Student Worksheet which was developed and used as a guide for revising so that it can be used in the field. The validation results from linguists, media experts, and material experts who have been analyzed are presented in table form below:

Table 3. Results of Validation Analysis of Language Experts UsingAiken's V

Rated aspect	Lots grain	Number *Aiken's V*	Coefficient Criteria *Aiken's V*
Grains	3	0,75	High Enough
Communicative and interactive	1	0,75	High Enough
Compatibility with student development	2	1	High
Conformity with the rules of language	2	0,75	High Enough
Use of terms, symbols and icons	2	0,75	High Enough
Average V		0,80	High Enough

Based on table 3, an average V of 0.80 is obtained which is included in the 0.60 category ≤ V < 0.80 with sufficiently high information or can be said to be valid. So it was concluded that contextually based Student Worksheets in mathematics subjects of Grade IV Elementary School students which were developed were valid in terms of language.

Table 4. Results of Media Expert Validation Analysis Using Aiken's V

Rated Aspect	Lots Grains	Number *Aiken's V*	Coefficient Criteria *Aiken's V*
Appearance	2	0,75	High Enough
Writing	3	0,83	High
Pictures	3	0,83	High
Language usage	3	0,75	High Enough
Presentation	1	0,75	High Enough
Average V		0,78	High Enough

Based on the table above, the results of the analysis from media expert validation show that Contextual-based Student Worksheets are valid for use in the learning process with an average of 0.78 which is included in the 0.60 category ≤ V < 0.80 with a fairly high description. So it can be concluded that Contextual-based Student Worksheets are valid from a media standpoint.

Table 5. Results of Material Expert Validation Analysis Using Aiken's V

Rated Aspect	Lots Grains	Number *Aiken's V*	Coefficient Criteria *Aiken's V*
Content Eligibility	6	0,79	High Enough
Eligibility of Presentation	6	0,91	Height
Average V		0,85	Height

From the results of the analysis of material experts shown in table 5 above, an average of 0.85 is obtained which indicates that it is in the category > 0.80 and the validity interpretation of Contextual-based Student Worksheets is in the high category so that it can be said to be valid in terms of material.

Table 6. Recapitulation of Validator Assessments

No	Validators Name	Score obtained		
		Language	Media	Material
1	Dr. Yohana Satinem, M.Pd.	0,80	-	-
2	Dr. Leo Charli, M.Pd.	-	0,78	-
3	Candra Gunawan, S.Pd.	-	-	0,85
amount		0,80	0,78	0,85
Average			0,81	

The results of the expert validation analysis show that Contextual-based Student Worksheets are valid for use in learning with an average of 0.81 which is included in the category > 0.80 with high information.

Level Implementation is carried out through two stages, namely the trial stage on individuals (one to one) consisting of 3 students and small group trials (small group) consisting of 6 students selected heterogeneously, namely students with high, medium and low abilities and selected based on gender according to the advice given by the homeroom teacher. After testing the students, the researcher also conducted a practicality test on the fourth grade homeroom teacher. First, the researcher tested the product individually (one to one) consisting of 3 students. Furthermore, the researchers did the same thing during small group trials (small group) consisting of 6 students. This trial was conducted to determine student responses after using the developed Student Worksheets. Filling out a response questionnaire is done in order to know the level of

practicality of the product. Then a practicality trial was carried out on the homeroom teacher of class IV by giving a teacher's response questionnaire which the teacher would assess. Presentation of test results data on individuals (one to one), small group trials (small group), and teacher practicality trials can be seen in the table below:

Table 7. Results of Testing Student Response Analysis One To One

No	Aspect	Indicator Assessment	Amount Grain	Percentage	Percentage Criteria
1	Feasibility of student worksheets	Interest	4	66,6%	Practical
		Suitability Picture	1	100%	Very practical
2	Content Eligibility	Material	4	100%	Very practical
3	Language Qualification	Usage Language	3	100%	Very practical

Contextual-based Student Worksheets that have been responded to by students are included in the very practical criteria, which means that contextually-based Student Worksheets in the mathematics subject of Grade IV Elementary School students do not need to make improvements to the product being developed so that the product can be used for trialssmall group without any revision.

Table 8. Results of Analysis of the Percentage of Student Responses in the Trial One To One

No	Aspect	Respondent	Percentage	Criteria
1	appropriateness	3 student	83,3%	Very practical
2	Content Eligibility	3 student	100%	Very practical
3	Language Qualification	3 student	100%	Very practical
Percentage Average			88,8%	Very practical

It is known from the table above that contextually based Student Worksheets are categorized as very practical because the results of the percentage analysis obtained eligibility data of 83.3%, content eligibility 100%, then language eligibility 100% with an average percentage of 88.8% so Student

Worksheets contextually based on mathematics lessons are categorized as very practical to use in the learning process.

Table 9. Results of Test Student Response Analysis Small Group

No	Aspect	Indicator Assessment	Amount Grain	Percentage	Percentage Criteria
1	Feasibility of student worksheets	Interest	4	74,9%	Practical
		Suitability Picture	1	66,6%	Practical
2	Content Eligibility	Material	4	87,5%	Very practical
3	Language Qualification	Usage Language	3	100%	Very practical

Contextual-based Student Worksheets that have been responded to by students are included in the very practical criteria, which means that contextually-based Student Worksheets in the mathematics subject of Grade IV Elementary School students do not need to make improvements to the product being developed.

Table 10. Results of Analysis of the Percentage of Student Responses in the Trial Small Group

No	Aspect	Respondent	Percentage	Criteria
1	appropriateness	6 student	70,75%	Practical
2	Content Eligibility	6 student	87,5%	Very practical
3	Language Qualification	6 student	100%	Very practical
Percentage Average			84,7%	Very practical

It is known from the table above that contextual-based Student Worksheets are categorized as very practical because the results of the percentage analysis obtained student worksheet eligibility data of 70.75%, content eligibility 87.5%, then language eligibility 100% with an average percentage of 84.7% so that the Worksheet Contextual-based students in mathematics are categorized as very practical to use in the learning process.

Table 11. Results of the Teacher Practicality Trial Analysis

No	Aspect	Indicator Assessment	Amount Grain	Percentage	Percentage Criteria
1	Content Eligibility	Component of the formulation of learning objectives	3	91,6%	Very practical
		Material components	3	91,6%	Very practical
2	Qualifications Presentation	Graph Component	2	87,5%	Very practical
		Component On language	4	87,5%	Very practical

Table 12. Results of Percentage Analysis of Teacher Practicality Trials

No	Aspect	Respondent	Percentage	Criteria
1	Content Eligibility	1 Respondent	91,6%	Very practical
2	Qualifications Presentation	1 Respondent	87,5%	Very practical
Percentage Average			89,5	Very practical

It is known from the table above that the contextual-based Student Worksheets are categorized as very practical because the results of the percentage analysis obtain 91.6% content eligibility data, then 87.5% presentation feasibility with an average percentage of 89.5% so that Student Worksheets are based Contextual learning in mathematics is categorized as very practical to use in the learning process.

Table 13. Results of All Contextual-Based Practicality of Student Worksheets

No	Appraiser	Grain Question	Percentage	Criteria
1	Candra Gunawan, S.Pd.	12	89,5%	Very practical
2	3 student of class IV	12	88,8%	Very practical
3	6 student of class IV	12	84,7%	Very practical
Percentage Average			87,6%	Very practical

Level Evaluation is the final stage in the development process to see the quality of the product that has been developed. Based on the explanation above, contextually based Student Worksheet products in mathematics can be concluded as a whole that fall into the valid and practical category and are feasible to try out. This means that contextually-based Student Worksheets in

mathematics can be used as a learning resource for teachers and fourth grade elementary school students in semester 2. This is in line with the opinion of Nabila et al (2021: 3937) that a product can be said to be practical if it can easily used by teachers and students.

4. Conclusion

Ased on research and discussion regarding the development of contextual-based student worksheets in class IV mathematics at SD Negeri 206 Simpang Nibung, the design used in developing student worksheets is using the ADDIE development model with stages Analysis, Design, Development, Implementation, and Evaluation.

The results of the research based on the analysis of the assessment of linguists, media and materials show that contextually-based Student Worksheets are classified in the high category with a percentage of 0.81 and based on the results of the calculation of student and teacher response questionnaires. Contextual-based Student Worksheets are classified as in the very practical category with a percentage of 87.6%. So it can be concluded that the feasibility of contextual-based Student Worksheets in class IV mathematics at SD Negeri 206 Simpang Nibung is included in the category of valid and practical and feasible to use.

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