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DEVELOPMENT OF COMBINED MODULE USING CONTEXTUAL SCIENTIFIC APPROACH TO ENHANCE STUDENTS' COGNITIVE AND AFFECTIVE

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ABSTRACT

This research on the development of experimental product test designs aims to develop learning products to solve problems that occur in the field and find out and analyze the mathematical problem-solving abilities and Habits of Mind of MTs students whose learning uses a combination of scientific approaches and contextual approaches compared to MTs students who use scientific approaches. The research subjects were conducted on students in Indonesia with details of 1 class at MTs Azzahra Batujajar for a limited trial, three classes from MTs Bhakti Pertiwi Cililin, MTs Albidayah, and MTs Al-Mukhtariyah Rajamandala for field trials, and two classes at MTs Nurul Hidayah Batujajar for product testing and used as the experimental class and the control class. The instrument in this research is a set of mathematical problem-solving abilities and a non-test to determine the students' Habits of Mind. The results of this study indicate that the process of developing teaching materials is carried out well, and the product is feasible to use. Mathematical problem-solving abilities and Habits of Mind of students who receive learning using a combination of scientific and contextual approaches are better than those who receive knowledge using a scientific approach.

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1. INTRODUCTION

Mathematics is a subject that requires a high level of understanding and also has a very important role in solving a problem that we often encounter in life. This is contained in Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 58 of 2013 concerning the 2013 Curriculum for junior high school/MTs, which states that the objectives of learning mathematics in junior high schools are, among others, students are expected to be able to understand concepts, use patterns in solving problems (Rosidin et al., 2019; Suhirman et al., 2016).

Problem solving is one of the important things contained in the purposes of learning mathematics. The students are able for problem solving in mathematics learning then they will be better in mathematics learning (Siagan et al., 2019; Simamora & Saragih, 2019; Sumirattana et al., 2017; Surya et al., 2017). Mathematical problem solving ability become one of the basic mathematical abilities that must be possessed by every student. Because the problem-solving skills is very important, then this ability should be given to students from early age as a provision in preparing competition in the real life so the students could be familiar to the challenges that they faced (Basri, 2019; Cevikbas & Argün, 2017; Irwanto et al., 2018; Tyas & Naibaho, 2021). However, the scope of reality is not accordance to all of theories that described above, the problem which is difficult to be solved at school, it is including on the two variables linear equation's theory.

Two variables linear equation is one of the subject matter in math which is a theory that is often considered difficult so that some students have adversity when working on modified math problems in the story question form. This is evident from previous research which found various errors made by students when working on linear equations of two variables (Fatoni et al., 2021; Putra et al., 2020; Santoso et al., 2019; Wicaksono, 2020).

In addition, the results of research conducted by Sukestiyarno et al. (2021) also concludes that the weak mathematical problem solving ability of students is caused by the lack of variety of teachers in optimizing teaching materials in the form of learning modules. The learning module used by the teacher in providing subject matter to students is considered inadequate. This affects students' ability to package concepts properly and correctly, so that it has an impact on low problem solving abilities.

The weak ability of students to solve a problem can be sourced from students' thinking habits (Pei et al., 2018; Umar, 2017). Students' thinking habits in dealing with and solving a problem will make students accustomed to finding new problems every time (Hodiyanto & Firdaus, 2020; Papadopoulos, 2019). This shows that students' Habits of Mind have an important role in the learning process of individual development in helping to solve a problem.

According to Akdeniz and Ekici (2019) that Habits of Mind or the habit of thinking as a step or method taken by intelligent people when facing a problem whose solution cannot be easily identified. This confirms what was conveyed by Prasad (2020) that it is difficult to get students to think mathematically because the assessment scheme carried out by teachers in learning is considered to lack respect for students' intellectual courage and humility, so that students' habits of mind do not develop. This can have an impact on the students' habits of mind continue to be trained, will synergize the right brain and left brain which in the end students get used to finding solutions to even difficult problems. Therefore, efforts must be made to improve students' mathematical problem solving abilities and Habits of Mind in particular to solve problems in two-variable linear equations story problems is to develop innovative teaching materials related to students' daily lives.

The urgency of developing these teaching materials needs to be packaged in a learning product that influences the achievement of students' mathematical problem solving abilities and Habits of Mind. Considering that developing mathematical problem solving skills and familiarizing students' thinking processes is not easy, it is necessary to have a learning approach integrated with teaching materials to encourage students to be active and find concepts independently, especially those related to problems in everyday life. One of them is the contextual teaching and learning approach, which is the most likely approach to help students find concepts oriented to everyday life.

Contextual Teaching and Learning (CTL) approach is learning that regulates students to be actively involved in the learning process so that they can find concepts learned through students' knowledge and experience (Selvianiresa & Prabawanto, 2017). Contextual

approach is applied by exposing students to contextual problems that will be solved by relating them to real situations.

In addition, in this effort to develop teaching materials, it also needs to be associated with a scientific approach. Kurniati et al. (2015) states that the development of mathematics learning tools with a contextual approach integrated with a scientific approach can produce valid, practical, and effective learning tools. Based on these problems, this study aims to determine the effectiveness of developing learning modules that combine two approaches, namely a scientific approach and a contextual approach, in improving students' mathematical problem solving abilities and habits of mind.

2. METHOD

The methods in this research are development research (research & development). The development research is an endeavor to develop the effective product to be used in school, and it does not aim to verify a theory. The development research flows described on Figure 1.

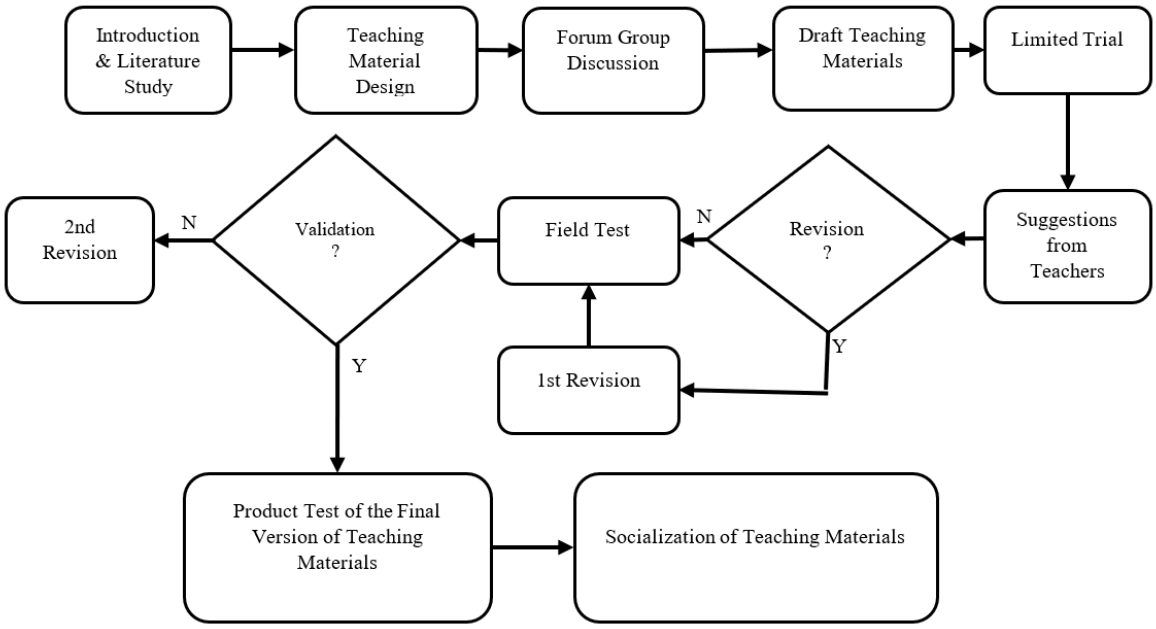


Figure 1. The development research flows

Figure 1 shows the stages of development research that the authors did to develop teaching materials from a combination of scientific approaches and contextual approaches. In the early stages, the authors conducted a preliminary study in the form of library research, school surveys and drafting. In the literature study, the researchers conducted a study of the theories related to the approach to be developed, besides that it also examined the characteristics of students, especially in their mathematical problem solving abilities. A school survey was conducted to see the SPLDV learning that had been carried out by MTs teachers, and interviews were also conducted with these teachers to find out what learning deficiencies should be improved. Then, the authors create the designs and drafts of module that will be developed for limited trials. After a limited trial, the authors seek input from the teacher to find out whether or not there is a revision of the developed teaching materials, if finding to be revised then the module must be revised, if it is not the teaching material must be continued to a broad trial. After extensively checked then product is validated by the

experts, if they found a revision then the teaching materials are revised for the second time, if they are not then the teaching materials are directly allowed to be tested. Then after testing the product, the compiler has the final form of teaching material and is ready to be socialized. Product testing activities are carried out with an experimental design involving two classes for the sample which are used as the experimental class and the control class.

The subject for the research trials is the students of 8th grade in MTs Nurul Hidayah, Batujajar, which the selected sample based on considerations created by the researcher and according to certain criteria that is total students, class situation, and teacher's suggestions. In this research, the selected sample as a research sample is students in grade of VIII A which have a total 27 students for being a control class, and the grade of VIII B which have a 28 students become an experimental class whereas all of students from both of class, totally 55 students, have been taught as the research The research location for the limited trial was carried out at MTs Azzahra Batujajar with a total of 29 students, while for the field test it was carried out in three schools namely MTs Bhakti Pertiwi Cililin, MTs Terpadu Albidayah, and MTs Al-Ikhsan Batujajar, all of them are located in Kabupaten Bandung Barat.

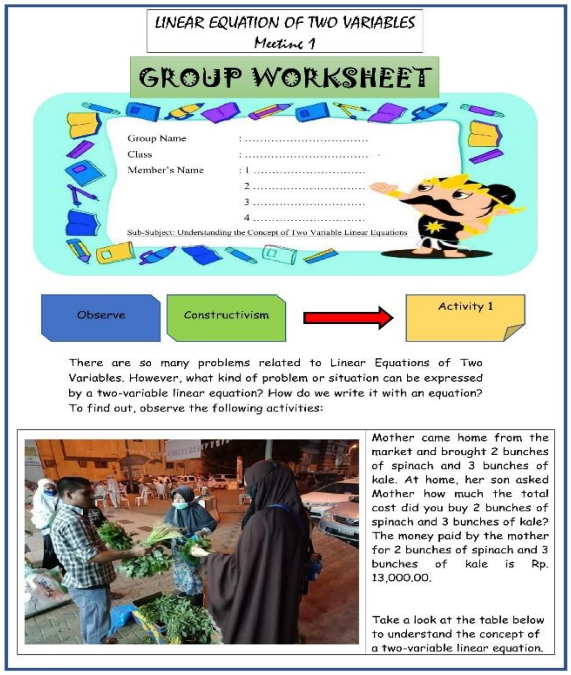
The compilers used questionnaires and interviews to determine the students' readability on the products developed in limited trial activities and field tests. Data processing was carried out using IBM SPSS Statistics Version 22 to test the results of product tests and using percentages presented descriptively.

3. RESULT AND DISCUSSION

3.1. Result

3.1.1. Teaching Material Development Process

From the description of the research objectives, to develop a teaching material using a combination of two approaches, a validation is needed for the teaching material itself. Validation is carried out on expert validators, namely lecturers, school supervisors, then subject teachers, and it is proven that the level of readability is proved to the level students concerned in the research. Lecturers provide validation for teaching materials whether or not it is appropriate for the developed teaching materials to be used with revisions or without revisions. The subject teacher also validates whether the content is in accordance with the proposed level or not and can be used with or without revision. While students are allowed to read carefully then interviewed whether they are able to achieve a high level of readability or not. The following is an initial view of the teaching materials before the limited trial is carried out, presented on Figure 2.



1st Meeting (2 x 40 minute)

Activity	Scientific Characteristics	Contextual Characteristics	Activity Description	Time
Core Activities		Learning Society	1. The teacher divides groups for students in the core group on WA/Classroom / Zoom at most four people on group	5 minute
			2. Each group is made a group (besides the core group) or broadcast messages (broadcast) by the teacher so that it is easy to coordinate with each group	
			3. Students pay attention to the teacher's comments regarding the linear equation of one variable in the core group	
			4. Students are given a problem where students have to give an example of an equation that has two variables	
			5. The teacher gives LKK to each group	
	Observe	Constructivism	6. Students and their groups observe the daily problems found in activity 1 LKK meeting 1 regarding the problems faced by mothers in daily life regarding the purchase of spinach and kale on the concept of linear equations of two variables	15 minute
		Inquiry	7. Students with their groups discuss to find ways to be able to solve problems in activity 2 LKK meeting 1 where problems are found in everyday life in the parking lot of a minimarket which has 4 cars and 7 motorbikes	
	Ask	Ask	8. Students are asked to arrange several questions in activity 3 LKK meeting 1, questions that arise in students' minds or those that they do not understand in the material	

Figure 2. Initial appearance of teaching materials before trial

Figure 2 shows the design or initial draft of the teaching materials that the authors developed prior to the trial. The validation results show that the average percentage of the validation aspects on the validation sheet of the teaching materials is still at 32%, so the expert validators conclude that the teaching materials can be tested with revisions.

The next step of this development research that the authors worked is a limited trial. The limited trial was carried out at MTs Azzahra Batujajar with 29 students present when the authors made observations in the field or called a limited trial. This limited trial was conducted to measure the students' readability of the teaching materials that the compilers developed. The technique that the authors used to obtain data from the trial is the form of interviews and giving questionnaires about the teaching materials that have read (see Table 1).

Table 1. Limited trial questionnaire results

No	Questions	Response	
		Agree	Do not agree
1.	Do you understand the problems given in the teaching materials?	12	17
		41.40%	58.60%
2.	Do you understand the commands from the tables in the teaching materials?	8	21
		27.60%	72.40%
3.	Do you understand the language contained in the teaching materials?	24	5
		82.80%	17.20%
4.	Is the language in the teaching materials effective/uncomplicated?	26	3
		89.70%	10.30%
5.	Are you able to capture the information contained in the teaching materials?	14	15
		48.30%	51.70%
6.	Are the teaching materials more practical than textbooks?	16	13
		55.20%	44.80%
Overall average		**57.50%**	**42.50%**

To strengthen the data readability of students during a limited trial at MTs Azzahra Batujajar, in addition to using a questionnaire, the compilers also conducted interviews with several students to find out what parts the students cannot understand in the modules that the compilers developed (see Table 1). Based on the results of interviews in general for aspects of writing with good and correct Indonesian rules and the use of effective and efficient language, students do not experience problems or find a language they do not understand. Meanwhile, for the clarity of presentation, students experience problems in terms of observing and reading tables, which may be caused by the lack of mastery of prerequisite material. This shows that the connection between mathematical material needs to be understood by students to solve the problems they are experiencing (Jannah & Apriliya, 2017; Kenedi et al., 2019; Siregar & Surya, 2017). The following is a documentation of the limited trial activities that the authors carried out at MTs Azzahra Batujajar (see Figure 3).

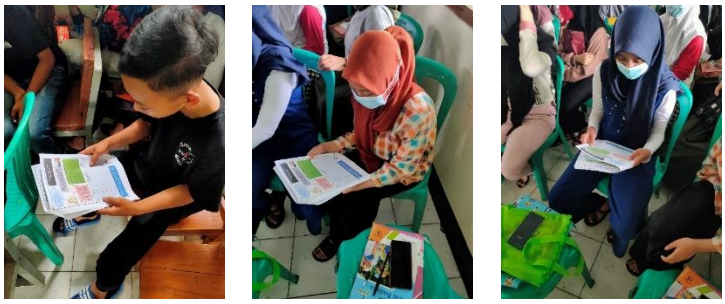


Figure 3. Limited trial activities

After conducting a limited trial, the teaching materials received input from the teacher and the original validator as well as from interviews and student questionnaires regarding the initial appearance of the teaching materials. The following is an initial view of the teaching materials after a limited trial was carried out and the first revision regarding the stages of learning such as praying should be included in the teaching materials to make them more interactive. The initial view is presented on Figure 4.

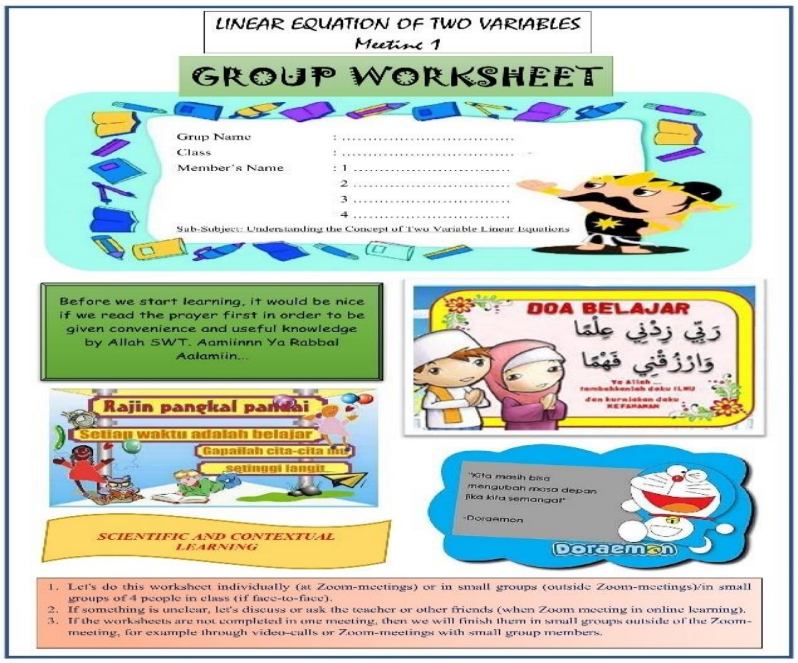


Figure 4. Display of teaching materials after limited trial

Then after doing a limited trial and getting a revision, the next stage is a field test. There is no difference in data collection techniques for field tests, such as limited trials, namely questionnaires and interviews. A field test was carried out in three schools in West Bandung, namely MTs Bhakti Pertiwi Cililin with 19 students, MTs Albidayah Cangkorah with 23 students, and MTs Al Mukhtariyah Rajamandala with 27 students, so the overall number of students in the test try wider is 69 students. The following is a table of results from a field test that the authors have carried out in three MTs located in Bandung Barat (see Table 2).

Table 2. Field test questionnaire results

No	Questions	Response	
		Agree	Do not agree
1.	Do you understand the problems given in the teaching materials?	31	38
		44.90%	55.10%
2.	Do you understand the commands from the tables in the teaching materials?	23	46
		33.30%	66.70%
3.	Do you understand the language contained in the teaching materials?	44	25
		63.80%	36.20%
4.	Is the language in the teaching materials effective/uncomplicated?	37	32
		53.60%	46.40%
5.	Are you able to capture the information contained in the teaching materials?	29	40
		42.00%	58.00%
6.	Are the teaching materials more practical than textbooks?	35	34
		50.70%	49.30%
Overall average		**48.00%**	**52.00%**

According to the results of interviews for a written aspects in a good and correct Indonesian rule and the use of effective and efficient language, there are some students who do not understand the language in the modules that the compilers developed. Meanwhile, for the clarity of presentation, it is the same as during the limited trial, students experience problems in terms of observing contextual problems in teaching materials and reading tables, which may be caused by a lack of mastery of prerequisite material. The following is a documentation of the limited trial activities that the authors carried out at MTs Bhakti Pertiwi Cililin, MTs Al Bidayah, and MTs Al Mukhtarah Rajamandala (see Figure 5).

Figure 5. Field test activities

After conducting field test, the next stage is the final validation (expert validation) carried out to find out whether the teaching materials developed after the discovery of several shortcomings at the trial stage such as limited trials and field tests and getting revisions from expert validators along with teacher to proceed to the product test stage. The results of the validation showed that the average percentage of the validation aspects on the validation

sheet of the teaching materials was 80%, so the expert validators concluded that the teaching materials could be tested for the product.

After conducting field test of teaching materials, they received feedback from the teacher and the original validator as well as from interviews and student's questionnaires regarding the content of the teaching materials. The following is a display of teaching materials after field test and getting a second revision regarding apperception activities must be in the teaching materials before the core activity takes place, so apperception activities are not only delivered orally by the teacher but are in teaching materials. The appearance of apperception on teaching materials after extensive testing and validation is presented on Figure 6.

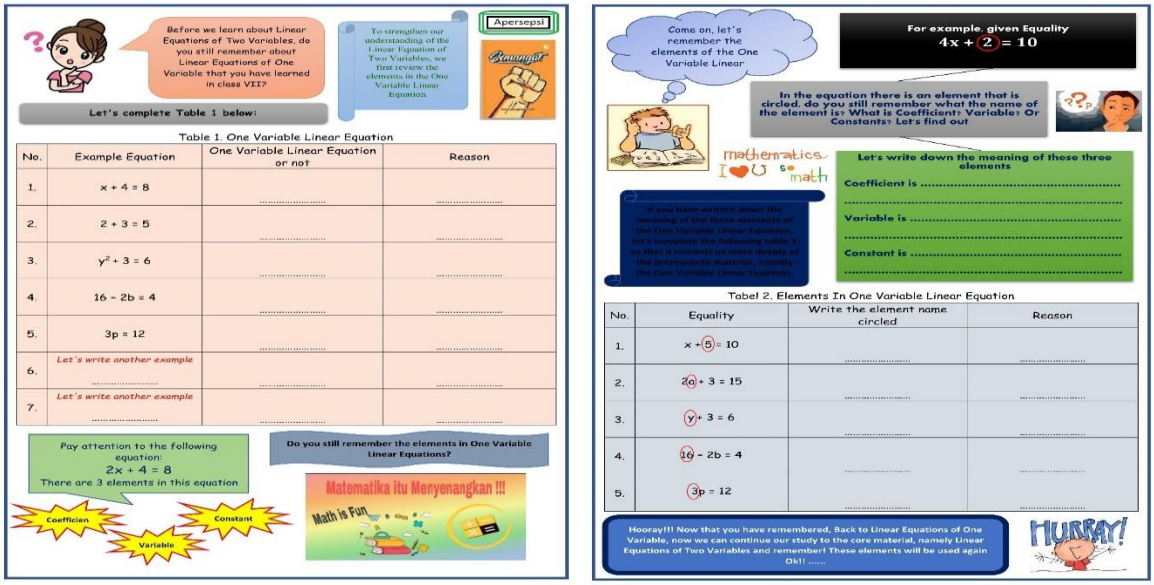


Figure 6. Display of teaching materials after field test and validation

The next step is after the teaching materials get validation from the expert validator then the teaching materials are tested. This product test activity was carried out at MTs Nurul Hidayah Batujajar in 2 classes of students' grade 8th with an experimental class and a control class conducted for 8 meetings on the material of Linear Equations of Two Variables. In practice, there are pretest and posttest activities to measure mathematical problem-solving abilities before and after teaching materials are used on students. The following are product testing activities carried out by the compilers (see Figure 7)

Figure 7. Product test activities

The last step of the product development stage carried out by the compilers is product socialization which is carried out during teacher meeting activities at MTs Nurul Hidayah Batujajar to provide information to teachers where the compilers have developed a teaching material compiled from a combination both of a scientific approach and a contextual

approach as one of the solutions for learning, especially in mathematics. The following are product socialization activities that the authors carry out (see Figure 8).

Figure 8. Product socialization

The following is the final version of the teaching materials when the product socialization activities are carried out, after the teaching materials have gone through the development flow that the compilers did (see Figure 9).

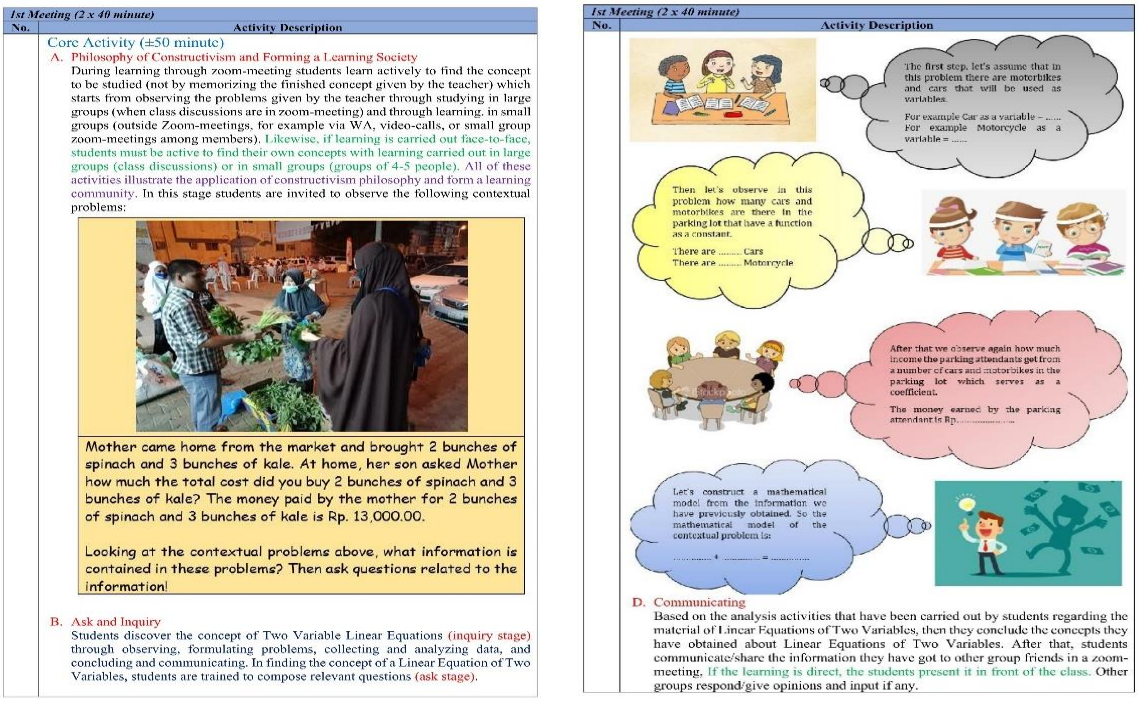


Figure 9. Final version of teaching material

3.1.2. Analysis of Students' Problem Solving Ability and Habits of Mind

To describe the problem solving skills and Habits of Mind of students in learning mathematics, data is needed in the form of values derived from pretest scores, posttest scores, and gain values. The pretest score is the student's initial test score before receiving a combined learning from a scientific approach and a contextual approach. Post-test scores are student test scores obtained after receiving a combination of scientific approach and contextual approach learning. Gain is the increase in student scores obtained from the difference between the pretest and posttest scores.

This test was given to students of class VIII A as a control class who received learning with a scientific approach and class VIII B as an experimental class who received

learning using a combination of a scientific approach and a contextual approach. Descriptive calculations to describe problem solving abilities can be briefly seen in Table 3.

Table 3. Description of problem solving ability scores and habits of mind

Mathematical Ability	Statistics	Learning Approaches					
		Combined Scientific and Contextual Approach			Scientific Approach		
		Pretest	Posttest	Gain	Pretest	Posttest	Gain
Problem Solving	$\bar{x}$	36	71		35	62	
	%	36.00%	71.00%	0.54	35.00%	62.00%	0.42
	S	11.80	6.30		8.60	12.10	
	Ideal Score	100		1	100		1
Habits of Mind	$\bar{x}$	69.43			79.77		
	%	44.08%			48.7%		
	S	8.20			6.87		
	Ideal Score	157.50			163.48		

Table 3 shows that the average pretest of the two classes is in the low category; this is indicated by the initial ability of the experimental class and control class students who are not much different. Then after the treatment, it can be seen that the average post-test of the two classes has increased and are both in the medium category. For the average of n-gain, both of classes are also in the medium category. Then for the standard deviation of mathematical problem solving abilities, it can be seen that the standard deviation of the experimental class pretest is greater in value than the standard deviation of the control class, which means that the values in the control class are more spread out than the experimental class, but after the treatment is given, the opposite applies to the control class posttest scores larger than the experimental class, which means that the posttest value of the experimental class is more spread out. Then for the results of the Habits of Mind posttest after the MSI calculation, it can be seen that the average of the two classes is in the medium category with the average value of the experimental class under the control class, while for the standard deviation of Habits of Mind, it can be seen that the control class is smaller than the experiment class which indicates that the data obtained from the control class is more spreading out.

To clarify the description of the research results, data analysis was carried out on the results of the pretest experimental class and control class to find out the differences in students' pre-abilities in the experimental class and control class through statistical tests which included the Normality Tested, if the data is not normally distributed then the test continued by doing Non-Parametric Test, namely the Mann Whitney Test, if the data is normally distributed then it will be continued with the Parametric Test which begins with the Homogeneity Test, if the data is not homogeneous then it will be continued to do the T' test, if the data is homogeneous then it will be carried out to do the Independent Samples T Test

The first testing step is the normality test for the pretest value of the experimental class and control class, which is used to find out which direction the next testing should be, whether Parametric or Non-Parametric Tests. Normality test was performed with the help of IBM SPSS Statistics Version 22 program.

Test criteria :If Sig. > α=5%, then the sample data is normally distributed

The results of the pretest normality test's calculation for the experimental and the control class for students' mathematical problem solving abilities are presented in Table 4.

Table 4. Normality test results pretest values problem solving ability

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Experiment	0.179	27	0.027	0.930	27	0.068
Control	0.149	27	0.128	0.940	27	0.123

a. Lilliefors Significance Correction

The calculation of the Kolmogorov-Smirnov test results (see Table 4), the significance value of the experimental class pretest < α is 0.027 while the control class pretest significance value > α is 0.128, which means that the experimental class pretest data is not normally distributed while the control class is normally distributed. Because one of the classes is not normally distributed, the next step is the Non-Parametric Test, namely the Mann Whitney Test.

The Non-Parametric Test, namely the Mann Whitney Test, is carried out if the data obtained are not normally distributed or the data is normally distributed but not homogeneous. The Mann Whitney test was carried out with the help of the IBM SPSS Statistics Version 22 program with the following hypotheses:

H_0: $U_1 = U_2$
H_1: $U_1 \neq U_2$

Test criteria: If Sig. > α=5%, then H_0 been accepted

The results of the Mann Whitney test's calculation of students' mathematical problem solving ability pretest scores are presented in Table 5.

Table 5. Mann Whitney test results pretest of mathematical problem solving ability

			Value
Mann-Whitney U			365.000
Wilcoxon W			743.000
Z			-.220
Asymp. Sig. (2-tailed)			.826
Monte Carlo Sig. (2-tailed)	Sig.		.833[b]
	95% Confidence Interval	Lower Bound	.826
		Upper Bound	.841
Monte Carlo Sig. (1-tailed)	Sig.		.417[b]
	95% Confidence Interval	Lower Bound	.408
		Upper Bound	.427

a. Grouping Variable: Group
b. Based on 10000 sampled tables with starting seed 2000000.

Table 5 show that the significance value is obtained 0.826. Because it has value of Sig. > α then H0 been accepted, so that it can be concluded that there is no difference in the mathematical problem solving abilities of MTs students who receive learning using a combination of scientific approaches and contextual approaches with those who receive learning using a scientific approach. After known, the conclusion from the t-test for the pretest value of the experimental class and the control class are no difference in the pre-ability of each class, then the author will re-analyze the posttest results for the experimental class and control class to find out the achievements made by each class.

The first step of test is the normality test for the posttest scores of the experimental class and the control class, which is used to find out which way the next testing should be, whether Parametric or Non-Parametric Tests. Normality test on α = 5% by using the IBM SPSS Statistics Version 22 program.

Test criteria: If Sig. > α, then the sample data is normally distributed

The results of the posttest normality test calculation for the experimental and the control class for students' mathematical problem solving abilities are presented in Table 6.

Table 6. Normality test results posttest values problem solving ability

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Experiment	0.141	27	0.178	0.952	27	.234
Control	0.125	27	0.200*	0.964	27	.461

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 6 show that the posttest significance value of the experimental class is 0.178 while the significance value of the control class is 0.200, which means that the posttest data of the two classes is normally distributed because it has a normal value Sig. > α. The next step is Parametric Test. Parametric test is performed if the obtained data is normally distributed. Parametric tests were carried out by helping of the IBM SPSS Statistics Version 22 program with the following hypotheses:

H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 > \mu_2$

Test criteria: If Sig. > α, then H_0 been accepted

The results of the Independent Samples T Parametric Test's calculation, the post-test scores for students' mathematical problem solving abilities are presented in Table 7.

Table 7. The posttest results of mathematical problem solving ability

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
									Lower	**Upper**
Score	Equal variances assumed	12.36	0.001	3.37	53	0.001	8.750	2.592	3.551	13.94
	Equal variances not assumed			3.33	38.57	0.002	8.750	2.620	3.448	14.05

The Levene's Test column the value of Sig. < α (see Table 7), which means that it can be concluded that the two variances are not homogeneous. Because the obtained data from the results' test are normally distributed and not homogeneous, the test is carried out with the T-Test. The test carried out is the T test, then the data used is equal variances not assumed so that it can be seen that the value of Sig. (2-tailed) is about 0,002. However, because the hypothesis testing uses a one-party statistical test (1-tailed) so for further ensure the correctness of the test above, we do it manually by comparing the calculated to the table. It can be seen from the test table that what we get is 3.33. Meanwhile, for the table value for the one-sided (1-tailed) test at 5% significance level in the test table above, df = 38 is obtained. The value from the obtained table is 2.024 which can be seen in Table T. Then the

next step, we will compare the count to the table which gives the result that count > table then H_0 is rejected which means that at the 5% significance level can be concluded that students' mathematical problem solving ability who receive a learning using the combined scientific approach and the contextual approach are better than students who receive learning using a scientific approach.

Furthermore, the authors also tested to the affective behavior, namely the Habits of Mind of students, the following are the results of testing of students' Habits of Mind.

Test criteria: If Sig. > α=5%, then the sample data is normally distributed

The results of the calculation of the posttest data normality test of the students' attitude scale Habits of Mind are presented in Table 8.

Table 8. Normality test results of the habits of mind students

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Experiment	0.085	27	0.200*	0.983	27	0.931
Control	0.097	27	0.200*	0.986	27	0.964

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Table 8 show the experimental class and the control class is equal to 0.200. So it can be concluded that the average posttest value on the habits of mind data is normally distributed. Parametric test is performed if the obtained data is normally distributed. Parametric tests were carried out with the help of the IBM SPSS Statistics Version 22 program with the following hypotheses:

H_0: $\mu_1 = \mu_2$
H_1: $\mu_1 > \mu_2$

Test criteria: If Sig. > α=5%, then H_0 been accepted

The results of calculation of the Parametric Independent Samples T-Test of the students' habits of mind are presented in Table 9.

Table 9. The results of the students' habits of mind

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
									Lower	**Upper**
Score	Equal variances assumed	0.611	0.438	-5.03	53	0.000	-10.342	2.054	-14.462	-6.223
	Equal variances not assumed			-5.05	51.8	0.000	-10.342	2.047	-14.450	-6.235

The Levene's Test column gets the value of Sig. > α (see Table 9), which means concluded that the two variances are homogeneous. Because the obtained data from the test results are normally distributed and homogeneous, then the test is carried out to the T-test. The test carried out is the T test, the used data is equal variances assumed so that can be seen that the value of Sig. (2-tailed) of 0.000. However, because of hypothesis testing uses a one-

sided (1-tailed) statistical test, so for further ensure the truth of the test, it be manually done by comparing the count to the table.

It can be seen from the test (see Table 9) that the count we get is -5.03. Meanwhile, the table value for the one-sided (1-tailed) test at the 5% significance level is obtained dk = n1 + n2 – k whereas n is the number of data, while k is the number of variables. So dk = n1 + n2 – k = 28 + 27 – 2 = 53. For the value from the obtained table is about 2,005 which can be seen in table T. Then the next step, we will compare the count to the table which gives the result that count > table so H_0 is rejected, which means that the significance level at 5% can be concluded that the Habits of Mind of MTs students who receive learning using a combination of scientific approaches and contextual approaches are better than those who receive learning using scientific approaches.

3.2. Discussion

This research aims to develop the learning materials, so they can be used as a solution to problems found in the field, regarding the lack of student problem solving abilities because the teaching used materials are less qualified. This is because the available teaching materials only focus on the material and practice questions, so learning becomes monotonous. Teachers should improvise so that education is not dominated by textbooks which have an impact on student activities in learning (Hasibuan et al., 2019; Rahmi et al., 2019; Sari & Yaniawati, 2019; Siagan et al., 2019; Ulandari et al., 2019).

Related to the process of developing teaching materials, it has been running smoothly without any problems. The teaching materials produced have gone through the validation stage by experts, teachers, and students to be feasible and effective to be used as learning teaching materials. This shows that good product development of teaching materials is teaching materials that go through expert validation tests to get excellent and practical categories (Andini & Yunianta, 2018; Putri et al., 2020; Rahmi et al., 2019).

In addition, one of the objectives of this research apart from developed teaching material products that are able to become solutions to problems regarding teaching materials in schools, this study also aims to examine the achievement of mathematical problem solving abilities and the Habits of Mind of MTs students after teaching materials using The combination of the scientific approach and the contextual approach has been developed compared to those using the scientific approach in schools as usual without any development for teaching materials. The research was carried out at the product test stage in development research after going through the development stages which were carried out in accordance to the stated by Budiarti and Haryanto (2016) in conducting their development research, if the product has been assessed as good then it will be said to be feasible to use and tested using two classes. as a sample to be used as an experimental class and a control class.

The average of pretest result is not found significant differences both the experimental class and the control class such as the research conducted by Yanti (2017) with an initial test of the pretest value and obtained the results that the basic abilities of the two classes were the same before being given treatment. Furthermore, the two groups were given different treatments where the experimental class was treated with teaching materials that had been developed while the control class was treated with a scientific approach that exists generally at school. Then, based on the results of posttest data analysis in the experimental class and control class, the mathematical problem solving ability in the experimental class is higher than the control class. It can be concluded that the mathematical problem solving ability of students who receive learning using a combination of scientific approaches and contextual approaches is better than students who receive learning using a scientific approach. This is in accordance to the research conducted by Mulhamah and Putrawangsa

(2016) who conducted research by applying a contextual approach in their learning to junior high school students equivalent to the results that there was an increased in students' mathematical problem solving abilities from cycle 1 to cycle 2, while it was also in accordance to the research conducted by Nuralam and Eliyana (2017) who used a scientific approach in their learning by getting the results that problem-solving abilities whose learning uses a scientific approach are higher than the realistic approach.

The research conducted by Rahmawati et al. (2014) found out that the gain value obtained by the upper-class and the lower class were both included in the moderate criteria. This thing is the same as this study whereas the gain value obtained by the experimental class and the control class, its increasing is included in the medium category. Then, based on the results of analysis of the non-test of affective behavior data in the experimental class and control class, the students' Habits of Mind in the experimental class were higher than the control class. It can be concluded that the Habits of Mind of MTs students who receive learning by using a combination of a scientific approach and a contextual approach are better than those who receive learning using a scientific approach.

According to the analysis of research data's result, it is known that the mathematical problem solving ability and Habits of Mind of MTs students who receive learning using a combination of scientific approaches and contextual approaches are better than those who receive learning using scientific approaches This is indicated by the difference in the average scores of pretest, posttest, and n-gain solving abilities and the average non-test scores of students' Habits of Mind in the experimental class and the control class. After being given treatment to experimental class students by using a combination of scientific approaches and contextual approaches and control classes with scientific approaches, the results of the analysis obtained support the hypothesis which states that mathematical problem solving abilities and Habits of Mind students who learn using a combination of scientific approaches and contextual approaches better than those who learn by using a scientific approach.

4. CONCLUSION

Based on the results of research that has been carried out regarding the development of teaching materials to improve problem solving abilities and the Habits of Mind of MTs students using a combination of scientific approaches and contextual approaches, it can be concluded: The process of developing teaching materials has been carried out well which is divided into 6 stages after the teaching materials are made, starting from (1) Initial Validation (Expert Judgment); (2) Limited Trial; (3) Field test; (4) Final Validation (Expert Validation); (5) Product Test (Experiment Class Sample and Control Class); and (6) Product socialization to obtain a statement that the product is suitable for use. The mathematical problem solving ability of students who learn by using a combination of a scientific approach and a contextual approach is better than students who learn by using a scientific approach. The Habits of Mind of MTs students who learn by using a combination of a scientific approach and a contextual approach are better than those who learn by using a scientific approach.

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