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Development of Student Worksheets Based on Multiple Intelligence in Thematic Learning of Grade IV Elementary Schools

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ABSTRACT

The various bits of intelligence of elementary school-age children can be explored and developed. This diverse intelligence is known as multiple intelligence. Student Worksheets based on multiple intelligences can be used for thematic learning so that students become more active and enthusiastic in participating in learning. The results of observations and interviews conducted before the research showed that the teacher had never made student worksheets and only used student worksheets in student thematic books. Students also never use multiple intelligence-based student worksheets in learning. This study aims to develop various intelligence-based student worksheets in thematic learning to improve students' numerous intelligence abilities. This study uses research and development (R&D) methods. This research was conducted at MI Baitul Huda Semarang, Central Java, Indonesia, with a total of 65 students. The results showed that (1) multiple intelligence-based student worksheets in thematic learning were developed based on an analysis of the needs of teachers and students. (2) the results of the assessment of the two students worksheet validators were 90.4% and 92.3% on every feasible criterion. The assessment from psychologists was 93.8% with very appropriate criteria, (3) the effectiveness of multiple intelligence-based student worksheets was assessed from the N-gain test with a result of 0.83 with an effectiveness percentage of 83. The results of the hypothesis test showed that t count (17.957) > t table (2.036), (4) the acceptability of multiple intelligence-based student worksheets is assessed based on teacher and student response questionnaires with a percentage of 87.5% and 97.5% on every feasible criterion.

Keywords: Student Worksheets, Multiple Intelligence, Thematic Learning

INTRODUCTION

The readiness of teaching materials in schools is a determining factor for the success or failure of a lesson. Teaching materials will determine the quality of good learning. Teachers are expected to be able to develop teaching materials as a source of learning to complement the elements of education. Teaching materials are the main thing that cannot be separated from learning activities to achieve learning objectives (S. D. Putri et al., 2020). Teaching materials in the form of student worksheets have a systematic preparation stage to direct students in learning. Student worksheets is a teaching material that acts as a support in the learning process. Student worksheets can be used to minimize the role of educators but to activate students more in the learning process (W et al., 2018). The policy in the 2013 curriculum is to change the learning paradigm from teacher-centered to student-centered (Maladerita et al., 2021). Teachers are expected to be able to apply a scientific approach to learning. The scientific method is learning designed so that students actively construct concepts through observing, formulating problems, submitting or

formulating hypotheses, collecting data, analyzing data, drawing conclusions and communicating the ideas found. The scientific approach helps students to understand the material directly by seeking information from various sources using observation so that students do not only depend on the information provided by the teacher (Firman et al., 2018).

The main focus of education is to create an effective learning atmosphere and learning process. The learning process should be carried out actively, creatively and interactively so that fun learning can be realized and adapted to students' physical and psychological development. The learning process is expected to change student behavior in a better direction. Understanding objectives can be achieved optimally, of course, cannot be separated from the help of a teacher. Teachers must innovate and be creative to implement an effective learning process (Zarei et al., 2019). Before learning, the teacher must prepare learning tools in the form of a syllabus, lesson plan, teaching materials and student worksheets (Deviana & Kusumaningtyas, 2019). The results of observations and interviews with ten teachers in 3 schools, namely public and private elementary schools, found that LKPD played an essential role in learning. The use of student worksheets can help students to solve a problem. The results of the three schools stated that they had used student worksheets in education. Teachers do not make or develop the worksheets used but only use books. The student worksheets used in the three schools are not based on multiple intelligences. The results of observations of the three schools stated that there were no teachers who used multiple intelligence-based worksheets in thematic learning.

The results of a literature study on previous studies obtained information about student worksheets. Researchers reviewed more than ten studies on student worksheets that had been made and developed by previous researchers. Researchers are trying to build student worksheets based on multiple intelligences to complement the achievement of abilities in earlier research. Researchers developed student worksheets based on numerous bits of intelligence aiming to improve students' multiple intelligence abilities. Multiple intelligence is critical because students, especially at elementary school age, have many skills that must be developed. These abilities can be acquired through discussion, question and answer, creativity and so on. Student worksheets based on multiple intelligences contain appropriate activities to improve students' numerous intelligence abilities. Thematic learning combines several subjects, including PPKn, SBdP, Indonesian, Science and Social Sciences. The combination of several of these subjects allows for the development of various abilities that exist in students. Multiple Intelligence is starting to be accepted in the world of education because it is considered to serve better all the intelligences possessed by students. The concept of various bits of intelligence dispels the myth of clever and unintelligent children; all children are intelligent. The idea of multiple intelligences also makes educators wise in seeing the differences in students and making students feel more accepted. Every child has nine bits of intelligence based on various concepts.

LITERATURE REVIEW

1. Sheet Work Participant educate

According to (Satura et al., 2021), student worksheets are printed teaching material in the form of sheets of paper that contain instructions for carrying out tasks that must be done theoretically and practically by students. In line with (Khasanah & Fadila, 2018), student worksheets are a type of handout to help direct students in learning in the form of printed materials and are designed for practice accompanied by questions to answer, checklists or diagrams to complete. According to (Pawestri & Zulfiati, 2020), student worksheets are a learning resource in the form of text sheets, instructions for carrying out tasks, and learning evaluations that students must work on. A student worksheet is a form of

implementing the teacher's role as a facilitator in the learning process.

2. Multiple Intelligence

According to (Luthfiana et al., 2018), multiple intelligence is multiple intelligence which can be interpreted as a person's ability to solve a problem. Intelligence includes thinking power and cognitive development. According to (Widiana et al., 2021), multiple intelligence is the overall ability of an individual to think and act in a directed manner, solve problems, acquire knowledge, process and control the environment effectively, and use the past to bring about a change in oneself for the better. Based on some sense, it could be concluded that multiple intelligence is a person's ability to think and act in solving problems using the various bits of intelligence they have.

3. Miscellaneous Multiple Intelligences

According to the theory, there are nine multiple intelligences, and all of them meet predetermined criteria. The nine bits of intelligence are:

a. Linguistic Intelligence
b. Logical-Mathematical Intelligence
c. Visual/Spatial Intelligence
d. Bodily-Kinesthetic Intelligence
e. Musical Intelligence
f. Interpersonal Intelligence
g. Naturalist Intelligence
h. Intrapersonal Intelligence
i. Existential Intelligence

4. Learning thematic

A learning theme is a learning activity that brings together various subjects in one piece (Kurniawati & Mawardi, 2021). According to (Lubis, 2022), thematic learning is a learning activity by not separating issues but using themes to unite them. In line with (Tur Rosidah et al., 2021), thematic learning combines various subjects using specific themes. Based on some of the definitions above, it can be seen that integrated learning uses pieces to link several issues to give experience meaning to participant education. The learning theme in grade 4 consists of 9 articles. Learning thematic class 4 theme 2, Always Save Energy, includes civics, Indonesian Language, Social Studies, Natural Sciences, and SBdP subjects.

MATERIALS & METHODS

Researchers use the Research and Development (R&D) with the ADDIE model. ADDIE models have steps that include Analysis, Design, Development or Production, Implementation or Delivery, and Evaluation (Agustien et al., 2018). Stage first thing to do in studying this is to analyze the need, that is, analysis of curriculum and analysis material. Stage second is planning design product by making student worksheets-based designs of multiple intelligences appropriate to learning theme 2 in grade IV. Stage third is developing from previously analyzed problems for upgrade quality products by existing problems. Stage fourth was implementing product results development to the subject study and applying on condition. Stage fifth is evaluating product results development to know the appropriateness of the product that has been made. The development research aims to determine the feasibility of the results of the development of multiple intelligence-based student worksheets in improving the ability of various bits of intelligence. The subject study is participant education class IV from MI Baitul Huda Semarang, Central Java, Indonesia. Technique data collection uses observation, interviews, questionnaires and test writing.

RESULT

Characteristics of Student Worksheets Based on Multiple Intelligences

The results of the needs questionnaire filled out by students were as follows: the majority of students stated that the material for theme 2 was not difficult to understand (78%), they needed the delivery of material that was short, concise and easy to understand with examples of pictures (52%), students felt mediocre with learning theme 2 (52%), students have used student worksheets in thematic learning (65%), students have never

used multiple intelligence-based student worksheets in thematic learning (91%), need pictures in student worksheets (91%) with the Comic Sans MS font type (52%), the size of the letters on the multiple intelligence-based student worksheets is shown as needed (48%), and the color display is required with a combination of dark and light (52%). Detailed questionnaire of student needs results can be seen in table 1 below.

Table 1 Results of The Student Needs Questionnaire

Number	Questions	Answer
1	Thematic material is difficult to learn	• Yes (5 answer, 22%) • No (18 answer, 78%)
2	Students need to submit material	• As complete as possible (4 answer, 17%) • Complete materials and examples (7 answer, 31%)
3	The feelings of students while undergoing thematic learning	• Happy (10 answer, 43%) • Sad (0%) • Bored (1 answer, 5%) • Just normal (12 answer, 52%)
4	Use of LKPD in learning	• Already (15 answer, 65%) • Not yet (8 answer, 35%)
5	Using multiple intelligence-based student worksheets in thematic learning	• Yet (21 answer, 91%) • Ever (2 answer, 9%)
6	Students state that there is a need for pictures in MI LKPD	• Required (21 answer, 91%) • No need (2 answer, 9%)
7	The type of letters required in the student worksheet	• Times new roman (11 answer, 48%) • Comic sans MS (12 answer, 52%) • Calibri (0%)
8	Size of letters multiple intelligence-based student worksheets	• Large (2 answer, 7%) • Small (8 answer, 35%) • As needed (11 answer, 48%)
9	Color display of student worksheets based on multiple intelligences	• Dark (2 answer, 9%) • Bright (9 answer, 39%) • Combination (12 answer, 52%)

The results of the needs questionnaire filled out by the teacher are as follows: the material for theme 2 is not difficult to teach, the subject matter is delivered in a short, concise, and easy to understand manner with examples and pictures, have used student worksheets in thematic learning but have never used student worksheets based on multiple intelligences, The teacher agrees that there are numerous intelligence-based student worksheets in thematic learning, additional material in multiple intelligence-based student worksheets must be in accordance with core competency, essential competencies and indicators, the presentation of material in student worksheets needs to be given an example picture, the size of the images on the student worksheets is adjusted to the needs, preparation and the presentation of multiple intelligence-based student worksheets must be made as attractive as possible, the language used in various intelligence-based student worksheets must be straightforward and simple with the type Comic Sans MS, the size of the letters in the student worksheets is adjusted to the needs and the color appearance of the student worksheets is a combination of dark and light colors, there is a need for pet book show the use in student worksheets based on multiple intelligences.

The Feasibility of Multiple Intelligence-Based Student Worksheets

Test appropriateness was obtained from validation from three validators, which included two LKPD experts and one psychology expert. Results validation expert, among other;

1. Student Worksheets Expert

Based on student worksheets, expert validator tests 13 indicators conducted by two expert validators. The validation includes the contents' feasibility, the appearance of the student worksheets based on multiple intelligences, and the language of the student worksheets (attachment). The

results of the student worksheets expert validation are as follows:

Table 2 Results Validation Student Worksheets Expert (1)

No.	Aspect which rated	Score	Criteria
1.	Content eligibility	26	Very good
2.	Student worksheets display based on multiple intelligences	12	Very good
3.	Language on Student worksheets	9	Well
The total score obtained		47	
Total score		52	
Average		3,6	
Percentage%		90,4%	
Criteria		Very Worth it	

Table 3 Results Validation Student Worksheets Expert (2)

No.	Variable	Score	Criteria
1.	Content eligibility	26	Very good
2.	Student worksheets display based on multiple intelligences	11	Very good
3.	Language on student worksheets	11	Very good
The total score obtained		48	
Total Score		52	
Average		3,7	
Percentage%		92,3%	
Criteria		Very Worth it	

Table 2 shows that the average score of the validation results by the student worksheet experts is 3,6, and the percentage is 90,4% with very decent criteria. As for suggestions from student worksheet experts, as follows: (1) add a brief understanding of main ideas and supporting ideas, (2) pay attention to writing colons, and (3) use language that students can understand. Table 3 shows that the average score of the validation results by the student worksheet experts is 3,7, and the percentage is 92,3% with very decent criteria. As for suggestions from student worksheet experts, as follows: (1) visualization of text is sometimes necessary, (2) consistency in format, (3) images must be genuinely representative, (4) be more thorough so there are no writing errors, (5) task instructions can be clarified. The results of the expert assessment in the aspect of student worksheets are generally perfect criteria. Based on the average rating, multiple intelligence-based student worksheets are feasible to be tested with revisions based on suggestions from student worksheet experts.

2. Psychology Expert

Expert validator psychology test based on eight indicators in students' worksheets multiple intelligence load variables in student worksheets. The results of the validation of psychologists are as follows:

Table 4 Results Validation Psychologist

No.	Variable	Score	Criteria
1.	Multiple intelligence content in student worksheets	30	Very good
Amount Score which Obtained		30	
Amount Score Whole		32	
Average		3,75	
Percentage%		93,8%	
Criteria		Very Worth it	

Table 4 shows that the average score of validation results by psychologists is 3,75, and the percentage is 93,8% with very decent criteria. The advice from psychologists is to add an experimental project on logical-mathematical intelligence related to the benefits of wind energy sources. The results of the expert assessment in the aspect of multiple intelligence content are generally in perfect criteria. This can be seen from the average rating so that multiple intelligence-based student worksheets are feasible to be

tested with revisions based on suggestions from psychologists.

The Effectiveness of Multiple Intelligence-Based Student Worksheets

1. Normality Test

The researcher tested the normality of the data using the Lilliefors Test method with Kolmogorov-Smirnov with the help of the Statistical Product and Service Solution (SPSS) version 22 program. The criteria for testing for normality are if the significance value is > 0.05 then the data is normally distributed and if the significance value is <0.05 then the data is not normally distributed. Based on the results of calculations performed using the SPSS version 22 program, the following data is obtained:

Table 5 Normality Test Results

		Unstandardized Residual
N		65
Normal Parameters	Mean	.0000000
	Std. Deviation	2.69569550
Most Extreme Differences	Absolute	.095
	Positive	.079
	Negative	-.095
Test Statistic		.095
Asymp. Sig. (2-tailed)		.200[c,d]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

Table 5 shows that the pretest data Sig value is 0.200 and the posttest Sig value is 0.200. Because the significance value of each is 0.200, which means more than 0.05, it can be concluded that the data distribution from the pretest and posttest thematic material class 4 theme 2 is otherwise normally distributed.

2. N-Gain Test

The N-Gain test is used to determine the increase in the ability of students' multiple intelligences in thematic material for class 4 theme 2 before and after using student worksheets based on multiple intelligences. Values are obtained from the learning outcomes of students during the pretest and posttest. The results of the calculation of the N-Gain test are as follows:

Table 6 N-Gain Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	65	-.13	.97	.7782	.20104
NGain_persen	65	-13.33	97.22	77.8168	20.10355
Valid N (listwise)	65				

Table 6 shows the results of calculating the N-gain value. The results of the analysis of the N-gain value for multiple intelligence abilities in class 4 theme 2 thematic material with an N-gain score of 0.83 and are in the high category with an effectiveness level of 83% with effective criteria. Based on the results of the N-gain score, it can be concluded that the student worksheets are based on multiple intelligences to be used as teaching materials in improving the multiple intelligence abilities of grade 4 elementary schools.

3. Hypothesis Testing

Test the hypothesis using the t-test which aims to find out whether there is significance or not after the use of multiple intelligence-based student worksheets in thematic learning. The results of the Paired Sample Test t-test are as follows;

Table 7 T-Test Result

		Paired Differences	t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference			
		Upper			
Pair 1	PRE TEST - POST TEST	-20.113	-17.957	64	.000

Based on the results of table 7 alculations performed, it shows that t count (17.957) > t table (2.036) then Ho is rejected, so according to the basis of decision making in the paired sample test it can be concluded that Ho is rejected and Ha is accepted, which means that there is a significant difference between multiple intelligence abilities before using multiple intelligence based student worksheets and after using multiple intelligence based student worksheets.

Acceptance of Multiple Intelligence-Based Student Worksheets

The acceptance test was carried out at MI Baitul Huda Semarang with 46 students and 2 teachers as respondents. The acceptance test was carried out to determine the response of educators and students to the use of multiple intelligence-based student worksheets in thematic learning. In addition, criticism and suggestions from respondents will be used as material for improvement for multiple intelligence-based student worksheets to make them more suitable for use.

1. The Results of The Teacher's Response Questionnaire

The teacher's response questionnaire instrument on multiple intelligence-based student worksheets totaled 8 statement items consisting of 4 student worksheet result statements and 4 multiple intelligence-based student worksheet use statements.

Table 8 Result of Student Response Questionnaires

Statement number	1	2	3	4	5	6	7	8
Score	4	4	3	4	4	3	3	3
Total score acquisition	28							
Total score	32							
Percentage	87,5%							
Criteria	Very worth it							

Table 8 shows that the results of the practical test of student worksheets based on multiple intelligences from class IV MI Baitul Huda Semarang teachers are in very feasible criteria with a percentage of 87.5%.

2. Results of Student Response Questionnaires

The questionnaire instrument for students' responses to multiple intelligence-based student worksheets totaled 5 statement items consisting of 5 thematic learning statements and 4 statement items on the use of multiple intelligence-based student worksheets with a total of 20 students.

Table 9 Results of Student Response Questionnaires

Statement number	1	2	3	4	5	6	7
Score	78	75	80	77	80	76	80
Total score acquisition	546						
Total score	560						
Percentage	97,5%						
Criteria	Very worth it						

Table 9 shows that the results of the acceptance test of student worksheets from class IV MI Baitul Huda Semarang students are in very feasible criteria with a percentage of 97.5%.

DISCUSSION

Characteristics of Student Worksheets Based on Multiple Intelligences

The results of the analysis of the needs of students and teachers at MI Baitul Huda Semarang, Central Java, Indonesia, can be concluded that students need student worksheets based on multiple intelligences. It can be with short, concise, easy-to-understand material and accompanied by sample pictures according to the material. Thematic learning is usually carried out and requires the help of multiple intelligence-based student worksheets to evaluate students' numerous intelligence abilities. Therefore, the development of multiple intelligence-based student worksheets must be adapted to the criteria needed by students. In line with Sukmagati's research (2020), the needs analysis results show that it is necessary to develop student worksheets so

that learning runs optimally. Zulmi & Akhlis (2020), the use of student worksheets in education helps increase the activity of students and makes it easier for teachers to achieve learning goals. Student worksheets are one of the teaching materials needed in learning because they can evaluate student learning outcomes. Making student worksheets is done by the teacher himself so that the evaluation goals are more easily achieved. Kurnia's research, et al. (2020) aims to develop student worksheets based on multiple intelligences and determine their feasibility as a guide in improving student learning outcomes. Izal and Wasis (2012) stated that various bits of intelligence could be grown, developed and involved in the learning process to increase the effectiveness and results of learning. Based on this, the development of multiple intelligence-based student worksheets as teaching materials can improve student learning outcomes and increase the intelligence potential they have.

The Feasibility of Multiple Intelligence-Based Student Worksheets

Validation activities carried out by student worksheet experts and psychologists on multiple intelligence-based student worksheets are essential to find out the validity of the developed student worksheets before being applied to learning (Widianto & Khumaedi, 2021; Utomo et al., 2018). The results of multiple intelligence-based student worksheet validation from three validators show that multiple intelligence-based student worksheets are feasible/valid to use in the learning process after going through a one-time revision process. Expert validation analysis of student worksheets from two experts obtained percentages of 90.4% and 92.3%. Meanwhile, the psychology expert's validation analysis received a rate of 93.75%. Student worksheets with validity from experts can be tried out in small class groups with 23 students. This is done to minimize errors when it is done in large classes (Istianah et al., 2015; Ikhwati et al., 2014; Noviyanti et al., 2013). The results that need to be improved from the small trials include the introduction of student worksheets and the delivery of material contained in student worksheets based on multiple intelligences. Introduction of student worksheets and material delivery in small classes of short duration delivered in 2 meetings. The material has not been sorted, and only the main points have been selected, resulting in not conveying the entire core of the material. The solution is to shorten the explanation of the material and use language that is easier for students to understand. In line with Sukmagati's research (2020), tests for the characteristics of student worksheets are carried out with a proper examination and readability test. The feasibility test for student worksheets is carried out by validating experts consisting of lecturers and teachers. The feasibility test is reviewed from three aspects, content presentation and language. The feasibility test analysis from experts gets a percentage of 90.03% with very feasible criteria. This is to the BSNP, which shows that student worksheets are very appropriate and effective for learning (Arafah et al., 2012). The preparation of student worksheets pays attention to the active involvement of students through discussion activities and simple experiments. Discussion activities and simple experiments can make students more engaged in answering questions and conveying experimental results (Rahayu et al., 2020).

The Effectiveness of Multiple Intelligence-Based Student Worksheets

The effectiveness of multiple intelligence-based student worksheets is tested by implementing them in learning, and the analysis is obtained from the results of the pretest and posttest given in the form of questions and the same questions; the difference lies in the way to answer them. Test questions are given through trials (pretest and posttest questions), then the normality test stage, N-gain test and hypothesis test to obtain effective measurement results. The results of this study indicate that the use of multiple intelligence-based student worksheets is

effective for increasing multiple intelligence abilities. This is to research conducted by Septiani (2020), which states that using numerous intelligence-based student worksheets in learning can increase student activity and learning outcomes. Improved learning outcomes are influenced by several factors, including the presentation of activities in student worksheets, the teacher's way of teaching, student experience, readiness and basic abilities possessed by students. Assessment of student test results is seen not only from the results of the post-test but also from the results during the learning process, namely from the value of student worksheets that are done in groups. Assessment in the context of multiple intelligences is not only in the form of written tests. Still, it can also be in the form of presentations, drawings, portfolios, journals and other results during the learning process (Dastgoshadeh & Jalilzadeh, 2011). According to Sukmagati (2020), Fitriani et al. (2017), and Pertiwi (2017), the use of student worksheets in learning has proven to be effective in improving student learning outcomes. Student worksheets as teaching materials are one of the factors that can improve students' thinking skills to improve learning outcomes. Learning by using student worksheets can provide direct experience to students through discussions and simple experiments, making learning more exciting and motivational for students. According to Wijayanto (2009), students will more readily accept a subject matter if it is conveyed through direct experiential learning.

Acceptance of Multiple Intelligence-Based Student Worksheets

The acceptance of multiple intelligence-based student worksheets is reviewed based on the results of implementing thematic learning in class 4 theme 2 with teaching materials in the form of numerous intelligence-based student worksheets. The results showed that the teacher's acceptance test was 87.5%, meaning that student worksheets based on multiple intelligences are highly acceptable for learning. The results of the study also show that the acceptance test of the students is 97.5%, which means that the multiple intelligence-based student worksheets are highly acceptable for use in learning. Along with research from Septiani et al. (2020), the teacher's response to using multiple intelligence-based student worksheets in education was excellent, with a score of 100%. The teacher believes that the activities presented can train students to understand material concepts through fun, varied, and student-centered learning activities. The essential requirement for student worksheets is a variety of student-centered stimulus activities (Widjajanti, 2008). Using easy-to-understand and enjoyable student worksheets can help students learn independently. Student worksheets must be arranged neatly, systematically, easily understood and attractive to arouse students' interest in learning. Septiani et al. (2020) obtained an average score of 88.69% in the very decent category. The results of student responses based on research by Kurnia et al. (2017) received a score of 81 in the outstanding category. This shows that students are interested and satisfied with using multiple intelligence-based student worksheets in the learning process. Prastowo (2012) argues that creative and innovative student worksheets motivate students because they can make learning more enjoyable. In addition, Sugiharti (2005) revealed that teaching activities that are adapted to the multiple intelligences possessed by students developed a spirit of learning and self-confidence in students.

CONCLUSION

This part presents 4 conclusions based on the research questions mentioned previously. The first conclusion is the characteristics of multiple intelligence-based student worksheets are as follows: 1) multiple intelligence-based student worksheets are arranged according to core competencies, essential competencies and indicators. 2) delivering material in multiple intelligence-

based student worksheets must be short, concise and easy to understand. 3) The language used in students' worksheets based on multiple intelligences must be straightforward. 4) Presentation of material in the worksheets of students based on multiple intelligences needs to be given an example of an image. 5) Use the Comic Sans MS writing type, 6) The font size is adjusted to the needs, and 7) The color display in student worksheets combines dark and light colors. 8) students' worksheets must have a user manual based on multiple intelligences. 9) There needs to be a task sheet based on multiple intelligences.

The second conclusion relate to the achievment of three validators, two student worksheet experts, and one psychologist assessed the feasibility of multiple intelligence-based student worksheets. Expert analysis of student worksheets gets percentages of 90.4 and 92.3 with very decent criteria. The psychological expert analysis receives a rate of 93.8% with very proper standards.

The third conclusion relate to the achievment of The N-gain test assessed the effectiveness of student worksheets based on multiple intelligence to get a result of 0.83 with an effectiveness percentage of 83%. The results of the hypothesis test showed that t count (17.957) > t table (2.036), then Ho is rejected. A knowledgeable audience might find this sentence hard to read. Consider simpler alternatives for intelligence.

The fourth conclusion relate to the achievment of the use of student worksheets based on multiple intelligences was assessed based on the response questionnaire from teachers and students. The results of the teacher's responses get a percentage of 87.5%, and the consequences of student responses get a rate of 97.5%, both of which are in very decent criteria.

Declaration by Authors

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REFERENCES

1. Agustien, R., Umamah, N., & Sumarno, S. (2018). Pengembangan Media Pembelajaran Video Animasi Dua Dimensi Situs Pekauman di Bondowoso Dengan Model Addie Mata Pelajaran Sejarah Kelas X IPS. *Jurnal Edukasi*, *5*(1), 19. https://doi.org/10.19184/jukasi.v5i1.8010
2. Hajhashemi, K., Caltabiano, N., Anderson, N., & Tabibzadeh, S. A. (2018). Multiple intelligences, motivations and learning experience regarding video-assisted subjects in a rural university. *International Journal of Instruction*, *11*(1), 167–182. https://doi.org/10.12973/iji.2018.11112a
3. Khasanah, B. A., & Fadila, A. (2018). Pengembangan Lkpd Geometri Transformasi Dengan Motif Tapis Lampung. *JURNAL E-DuMath*, *4*(2), 59. https://doi.org/ 10.26638/je.734.2064
4. Kurniawati, D., & Mawardi, M. (2021). Pengembangan Instrumen Penilaian Sikap Gotong Royong dalam Pembelajaran Tematik di Sekolah Dasar. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(3), 640–648. https://edukatif.org/index.php/ edukatif/article/view/387
5. Lubis, N. A. (2022). Penerapan Pembelajaran Tematik Integratif Berbasis Saintifik di Masa Pandemi Covid-19. *Jurnal Basicedu*, *6*(5), 7674–7682.
6. Luthfiana, A., Ambarita, A., & Suwarjo, S. (2018). Developing Worksheet Based on Multiple Intelligences to Optimize the Creative Thinking Students. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, *7*(1), 1. https://doi.org/10.25273/ jipm.v7i1.2430
7. Pawestri, E., & Zulfiati, H. M. (2020). Pengembangan Lembar Kerja Peserta Didik (Lkpd) Untuk Mengakomodasi Keberagaman Siswa Pada Pembelajaran Tematik Kelas Ii Di Sd Muhammadiyah Danunegaran. *TRIHAYU: Jurnal Pendidikan Ke-SD-An*, *6*(3). https://doi.org/10.30738/trihayu.v6i3.8151
8. Putri, S. D., Ulhusna, M., Zakirman, & Gusta, W. (2020). Improvement of student science literacy skills through edmodo-based teaching materials in learning science in elementary school. *International Journal of Scientific and Technology Research*, *9*(3), 4649–4652.
9. Satura, Y. T., Abdullah, A., & Rery, R. U. (2021). Pengembangan LKPD Aplikatif Integratif Berbasis Inquiri Terbimbing Pada

Materi Kesetimbangan Kimia. *Jurnal Pijar Mipa*, *16*(1), 64–67. https://doi.org/10.29303/jpm.v16i1.1647

10. Tri, M., Roemintoyo, R., & Yamtinah, S. (2018). Textbooks Thematic Based Character Education on Thematic Learning Primary School: An Influence. *International Journal of Educational Methodology*, *4*(2), 75–81. https://doi.org/10.12973/ijem.4.2.75
11. Tur Rosidah, C., Sulistyawati, I., Achmad Fanani, A., & Pramulia, P. (2021). Lembar Kerja Peserta Didik (Lkpd) Pembelajaran Tematik Berbasis Tik: Ppm Bagi Guru Sd Hang Tuah X Sedati. *BERNAS: Jurnal Pengabdian Kepada Masyarakat*, *2*(3), 660–666. https://doi.org/10.31949/jb.v2i3.1319
12. W, A. A., Abdurrahman, A., Suyatna, A., Distrik, I. W., & Herlina, K. (2018). Practicality and Effectiveness of Student' Worksheets Based on Ethno science to Improve Conceptual Understanding in Rigid Body. *International Journal of Advanced Engineering, Management and Science*, *4*(5), 400–407.
13. Widiana, I. K., Sudarma, I. K., & Dibia, I. K. (2021). Integration of Multiple Intelligences in Thematic Instructional Kit in Elementary School. *International Journal of Elementary Education*, *5*(1), 1. https://doi.org/10.23887/ijee.v5i1.33841

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