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Digital Student Worksheet Oriented to Problem-Based Learning in Science Subjects for Elementary School Students

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ABSTRAK

Guru mengalami kesulitan dalam mengembangkan perangkat pembelajaran, salah satunya adalah lembar kerja peserta didik. Perkembangan zaman menuntut guru untuk memanfaatkan teknologi yang ada. Oleh sebab itu, diperlukan inovasi dan kreativitas guru untuk menciptakan pembelajaran yang menarik dan menyenangkan. Penelitian ini dilakukan bertujuan untuk mengembangkan Lembar Kerja Peserta Didik digital berbasis pemecahan masalah pada mata pelajaran IPA untuk kelas tinggi yang valid dan dapat diimplementasikan. Jenis penelitian yang digunakan adalah Research and Development (R&D). Siswa kelas V berjumlah 32 orang yang menjadi subjek penelitian. Untuk menguji tingkat validitas peneliti melibatkan ahli media, ahli materi, dan juga ahli bahasa. Data dikumpulkan dengan cara melakukan observasi, wawancara untuk mendapatkan analisis kebutuhan, dan menyebarkan kuesioner. Adapun persentase skor hasil dari uji kelayakan diperoleh beberapa expert judgement, antara lain: ahli media memperoleh skor presentase 92,50%, ahli materi memperoleh skor presentase sebesar 97,50% dan ahli bahasa memperoleh nilai presentase sebesar 87,50%. Sedangkan hasil uji coba one to one memperoleh skor 89,17% langkah selanjutnya peneliti melakukan uji coba kelompok kecil memperoleh hasil 91,33% termasuk dalam kategori sangat baik. Secara umum lembar kerja peserta didik digital dapat dijadikan sebagai bahan ajar penunjang dalam pembelajaran IPA khususnya pada kelas V Sekolah Dasar yang dapat dikerjakan secara mandiri dan memberikan implikasi kepada guru Sekolah Dasar serta peneliti selanjutnya untuk mengembangkan bahan ajar khususnya LKPD digital berbasis PBL.

ABSTRACT

Teachers have difficulty developing learning tools, one of which is a student work sheet. The evolution of the times demands that teachers make use of existing technology. Therefore, it is necessary for the innovation and creativity of teachers to create interesting and enjoyable learning. The research was conducted with the aim of developing a problem-solving-based digital Students Working Sheet on IPA subjects for the highest grade that is valid and implementable. The type of research used is Research and Development (R&D). A total of 32 V-class students are subject to research. To test the level of validity of researchers involved media experts, material experts, and also linguists. Data is collected through observations, interviews to obtain needs analysis, and the dissemination of questionnaires. As for the percentage of the results of the qualification test, several expert judgements were obtained, among others: the media expert scored a presentation score of 92.50%, the material expert scared a presentation of 97.50% and the linguist scored the presentation of 87.50%. While the one-to-one test results scored 89.17% next step the researchers conducting a small group test scored 91.33% included in the very good category. In general, the digital learner work sheet can be used as a supporting teaching material in the learning of IPA in particular in the class V of the Basic School which can be done independently and give implications to the teacher of the Elementary School as well as further researchers to develop teaching materials in particular the digital LKPD based on PBL.

1. INTRODUCTION

The 2013 curriculum is a curriculum that is deliberately designed to encourage students to participate actively in class. An approach that places more emphasis on students is a problem-based approach, which presents a contextual problem that is closely related to everyday life. The demands in the

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2013 curriculum emphasize three domains of competence, namely the domain of knowledge, the domain of attitudes, and the domain of skills (Nafi'ah, 2019; Supriatna et al., 2022). As the curriculum develops, technology also develops rapidly. The use of technology can be one way to develop interesting and interactive learning tools. However, it is still unfortunate that many teachers do not utilize technology and do not teach lessons based on real life (Amaliyah, 2021; Mahjatia et al., 2020).

The problem that is often found in the field is that implementing interesting learning is very difficult to do, it requires teacher creativity and innovation to make it happen. Moreover, children aged 7-11, based on Piaget's cognitive development theory, are included in the concrete operational stage. Children who are in this phase are starting to be able to think logically but their thinking abilities are very concrete (Darmadi, 2017; Supriyono, 2018). Science learning is very necessary in elementary schools. Science essentially consists of 4 components including: attitudes, processes, products and applications. Attitudes relate to a person's desire to know about existing phenomena, such as: natural phenomena, living creatures, objects, and cause and effect relationships that give rise to new problems that can be solved with appropriate methods (IMCW Putra et al., 2022; Yuliati, 2017). The science learning process is a process of solving problems using scientific methods. Products in the form of facts, principles, theories and laws. Application is the application of scientific methods and science concepts in everyday life. These components cannot be separated and are related to each other (Lase & Lase, 2020; Singgih, 2020). However, in science learning, students do not participate actively in class, tend to prefer chatting with their friends rather than listening to explanations from the teacher, choose to play games rather than reviewing the material that has been given, teachers also do not link science learning with everyday life and there is a lack of parental concern. towards children's education. This makes student learning outcomes low. The role of teachers and parents is very necessary to overcome this problem.

The potential that exists within students needs to be developed by improving the quality of learning. Quality learning is an alternative way to develop their potential. Factors that can influence the quality of learning include teachers, students, methods, approaches, learning models used, class atmosphere, and suitability of subject matter to basic competencies and learning objectives themselves (Dewi & Agustika, 2022; Sandra et al., 2021). Lack of innovation in learning makes learning boring, the learning atmosphere is monotonous, students are not able to explore the subject matter and tend to be passive, the role of the teacher is very dominant, because teachers still experience difficulties in developing learning tools. An effort that can be made to improve learning loss requires an innovative learning model in the form of learning with a problem-based approach (Halimah et al., 2023; Swiyadnya et al., 2021). This approach begins by presenting a contextual problem, then students search for various information and solve the problem independently. The stages of the problem-based approach are: (1) Oriented to students, (2) Guiding students to learn, (3) Guiding students to carry out investigations independently or in groups, (4) Developing and presenting the results of their work, (5) Analyzing and evaluate the problem solving process (Hendriana et al., 2018; Istiqomah & Siswono, 2020). The development of good teaching materials must be adapted to the child's developmental stage. Worksheets are arranged systematically and as a means of support in the learning process, consisting of brief material and practice questions in order to create meaningful learning (Gustiawati et al., 2020; GYMA Putra et al., 2021). Apart from that, children also need to be trained in critical thinking skills to solve problems.

Critical thinking is the ability of students to analyze existing problems and be able to find alternative answers to existing problems. This ability is very important to apply in elementary schools, because critical thinking ability is a fundamental skill that must be mastered by students (Effendi et al., 2021; Rosário et al., 2019). The importance of critical thinking skills that students must have, critical thinking skills need to be trained as early as possible in order to prepare for modern education with critical thinking that can help students face problems that are closely related to everyday life. In fact, in learning activities the role of the teacher is very dominant, students tend to be passive, the role of students in the class is still lacking, such as being embarrassed to express opinions in class, reluctant to respond to questions from the teacher, and not exploring their reasoning power and developing their potential (Nuzulaeni & Susanto, 2022; Shinta sunny et al., 2022). Apart from thinking critically, students are expected to be able to participate actively and independently, and teachers need to prepare tools that can support learning. Learning tools consist of several of them: learning syllabus, Learning Implementation Plan, teaching materials, and learning results tests. Teachers need to develop and prepare learning tools in the form of teaching materials, especially LKPD. This worksheet can be used as a reference for student learning resources (Aisyah Aini et al., 2019; Utami et al., 2020). The reason worksheets are really needed in the learning process is because from the point of view of their use, digital LKPD are more effective and can be accessed at any time via sophisticated technology such as: cellphones, laptops, tablets, and these worksheets can train cognitive abilities in depth (Adifta et al., 2022; Usman et al., 2022).

Student Worksheets (LKPD) contain sheets containing material, summaries and instructions for students to carry out tasks given by the teacher in order to achieve basic competencies and learning objectives. Teaching materials are really needed by students in learning activities. Apart from that, there are still worksheets that are less interesting, teachers have not been able to package these worksheets to be meaningful and interesting (Andeswari et al., 2022; Mulbasari et al., 2021). A good LKPD is a worksheet that students can use to actively participate in learning activities. The function of the worksheet is to encourage students to develop their potential. Based on the description above, LKPD can be used as teaching material that can be used in learning activities. The aim of developing this worksheet is to help students carry out learning activities in order to master their understanding of knowledge and skills (Friedl & Fantz, 2014; GYMA Putra et al., 2021). Worksheets can also stimulate students to gain new experiences to make learning meaningful.The characteristics of worksheets include: Contains all the necessary steps, instructions are written using simple sentences, vocabulary is appropriate to the child's cognitive development stage, contains questions that must be worked on and provides free space to write answers, provides clear notes, contains pictures according to the material so that it is easy for children to understand (Astuti, 2021; Friedl & Fantz, 2014). A good worksheet must meet the requirements in its preparation. The conditions that must be met include: didactic requirements, construction requirements and technical requirements. These conditions must be met in the compiler so that it can be used effectively.

In line with the opinion above, according to Wiwik Okta, the research title is "Development of Student Worksheets (LKPD) Based on Contextual Teaching and Learning (CTL) in Elementary Schools. The results of the research state that LKPD based on the CTL approach is classified as valid, practical, suitable for use and very effective in supporting the learning process (Susilawati, 2022). Other research states that interactive E-LKPD material for introducing flat figures based on ethnomathematics for class I students is feasible and can improve students' mathematics learning outcomes (Prayoga et al., 2022). Other research also states the same thing that E-LKPD is designed to produce standards that are effective, reasonable and attractive. e-LKPD applies to the learning process at school (Friska et al., 2022). Furthermore, research conducted by other researchers shows that the development of student worksheets (LKPD) on life organization systems material for class VII SMP is very suitable for use in the learning process (Selmin et al., 2022). Findings from other research also show that STEAM-based interactive LKPD is effective in improving learning outcomes for class V social studies content and scores are in the very good category (Riyani & Wulandari, 2021). Based on previous research on student worksheets, several researchers have developed these products, but this research is focused on solving the problems found by researchers, namely being one solution for developing interesting learning tools, in the form of student worksheets in digital form. The novelty of this research lies in the use of worksheets that students can access anytime and anywhere. This worksheet utilizes a live worksheet as a supporting application in the process of creating digital LKPD. The approach developed in compiling digital LKPD is a problem-based learning approach.

The difference between the LKPD that the researcher developed and previous researchers is that this worksheet was prepared based on problems found at SDN Cipinang Melayu 05 Pagi that students found it difficult to understand the subject matter of the human respiratory system, then the researcher packaged the LKPD using a problem based learning based approach. The aim of developing digital student worksheets based on problem based learning is to improve thinking process skills in analyzing existing problems related to daily life, foster curiosity to search for information, develop understanding, knowledge, skills and make students active in solve the problems presented and can be used as a reference for teachers in developing interesting learning tools, one of which is digital LKPD.

2. METHOD

This research uses the Research and Development (R&D) research method. The research methods used produce certain products, and test the product's effectiveness. The approach used in this research uses a 4D approach which consists of four stages, namely define (definition stage), design (design stage), develop (development stage), and disseminate (deployment stage) (Mustami et al., 2019). The subjects of this research used class V students at SD Negeri Cipinang Melayu 05 Pagi with a total of 32 students. Data collection techniques through observation, interviews and distributing questionnaires. The data analysis techniques used are quantitative and qualitative. Qualitative data such as: results of needs analysis, input and suggestions from class teachers. Quantitative data was obtained from the results of obtaining scores from several experts, including: media experts, language experts and material experts. Quantitative data is needed to get results whether this digital LKPD is valid and practical (Dewi & Agustika, 2022; Purwanto, 2020). The following stages of the 4-D approach are shown in Figure 1.

Figure 1. 4D Approach Development Model

The 4D approach has several stages, namely: the define stage discusses needs analysis, curriculum analysis and material analysis. The design stage is choosing what product you want to develop, determining the format to use and compiling a storyboard. Then the third stage is the development stage where the product to be developed is a digital LKPD based on Problem-Based Learning on Class V Elementary School Science Lesson Content. The next stage is Disseminate, which aims to distribute digital LKPD products to students. This product will also be tested individually and in small groups. At the field test stage, students are given a link to the Liveworksheet website, which is a digital worksheet that students can work on directly on the website. The data collection instrument is shown in Table 1.

Table 1. The Data Collection Instrument

No	Activity	Respondent	Amount	Instrument
1.	Needs Analysis	Class V Teacher at SDN Cipinang Melayu 05 AM	1 Educator	Interview
		Class V Students at Cipinang Melayu State Elementary School 05 AM	1 Student	Interview
2.	Expert Test (Expert Judgment)	Materials Expert	1 Expert	Questionnaire
		Media Expert	1 Expert	
		Linguist	1 Expert	
3.	Individual Trial	Class V Students	4 Students	Questionnaire
4.	Small Group Trials	Class V Students of Cipinang Melayu State Elementary School 05 AM	10 Students	Questionnaire

Then students are given a questionnaire with a scale of 1-4. The resulting scores will be transformed into percentage results into a table. The following is a table of data collection instruments and score forms on a Likert scale, as shown in Table 2.

Table 2. The Form the Score in a Rating Scale

No	Questionnaire Selection Criteria	Scoring Levels
1.	Not good	1
2.	Pretty good	2
3.	Good	3
4	Very good	4

The assessment instrument grid used in this research is shown in Table 3,Table 4,Table 5, and Table 6.

Table 3. The Assessment Instrument Grid for Students

No	Instrument	Sub Principal	Question Number
1.	Display of digital worksheet teaching materials	Image suitability	2
		Suitability of writing	3
		The digital LKPD design is attractive and easy to use	10
		Color combinations on digital LKPD	11
		The use of language is easy to understand	5
2.	The attractiveness of digital LKPD teaching materials	The digital LKPD is interesting to use	6
3.	Delivery of material	The delivery of the material provided is clear and easy to understand	4

No	Instrument	Sub Principal	Question Number
		The questions are raised based on problem solving	7
		The questions are raised by critical thinking	8
		The material is related to everyday life	9
4.	Benefits of using digital LKPD	Ease of use of LKPD by using Liveworksheet	1.12
		LKPD finds new experiences in learning	13
		LKPD encourages student enthusiasm and makes learning interactive	14
		The relationship between learning videos and LKPD material	15
		Total	**15**

Table 4. The Assessment Instrument Grid for Material Experts

No	Instrument Indicator	Sub Principal	Question Number
1.	Quality in the contents of the LKPD	Conformity of material content with KD and Achievement Indicators	1
		Suitability of material coverage with the learning objectives to be achieved	2
		Suitability of material content to students' development stages	3
2.	The truth of the material and questions	Accuracy of material about the human respiratory system	4
		Material completeness	5
		The material is related to everyday life	6
3.	Feasibility of presentation	Feasibility of presenting digital LKPD	7
		The complexity of presenting digital LKPD	8
4.	Use of Problem Based Learning	Suitability of LKPD material based on PBL syntax	9
5.	Complete digital LKPD presentation	Complete digital LKPD presentation	10
		Total	**10**

Table 5. The Assessment Grid for Linguists

No	Instrument	Sub Principal	Question Number
1.	Language eligibility	The language used is easy to understand	1
		The use of language is appropriate to the development of students	2
		Communicative use of language	3
		The language used is in accordance with PUEBI general guidelines	4
		Coherency and integration of language use	5
		Total	**5**

Table 6. The Assessment Grid for Media Experts

No	Instrument	Sub Principal	Question Number
1.	Digital LKPD cover design	Accurate selection of size and type of letters on the cover	1
		Combination of color selection on digital LKPD	2
		Clarity of the image on the cover	3
		Clarity of digital LKPD instructions	4
2.	Design the contents of digital LKPD	Suitability of digital LKPD layout	5
		Complete digital LKPD layout	6
		Suitability of images and videos contained in the LKPD	7
		The attractiveness of digital LKPD design	8
3.	Presentation of material	The presentation of material and practice questions are arranged systematically	9

No	Instrument	Sub Principal	Question Number
	and practice on LKPD questions	The accuracy of the material is based on the Problem-Based Learning approach	10
		Total	**10**

3. RESULT AND DISCUSSION

Result

The product developed by researchers is a digital student worksheet using a problem based learning approach. The aim of the LKPD was developed to train students' thinking in solving existing problems. This research uses a 4-D approach which consists of four stages, namely: Define, Design, Development, Disseminate. Define stage, this stage explains what is needed in learning science in class V elementary school. The steps include: first analyzing needs, researchers conducted observations and interviews at SDN Cipinang Melayu 05 Pagi. Based on the results of observations and interviews with class teachers at SDN Cipinang Melayu 05 Pagi, this school only uses textbooks provided by the government, it is difficult to make interesting worksheets, the learning media used are only videos from YouTube, and the majority of students have not yet know the LKPD. Second, do an analysis of the students, not all children have the same abilities/intelligence, some have fast thinking processes and also tend to be slower in receiving the information provided. Third, task analysis, this analysis relates to things that must be considered to determine Basic Competencies and Achievement Indicators. The following Basic Competencies and Achievement Indicators that must be achieved by students in science subjects are shown in Table 7.

Table 7. The Basic Competencies and Achievement Indicators

Basic Competencies (KD)		Achievement Indicator (IP)	
3.2	Explain the respiratory organs and their functions in humans, as well as how to maintain the health of the respiratory organs in humans	3.2.1	Understand the meaning of the human respiratory organ system.
		3.2.2	Explain the function of the respiratory organs in humans
		3.2.3	Analyzing diseases/disorders of the human respiratory system
		3.2.4	Analyzing the impact of Covid-19 on respiratory organs in humans

Next, carrying out the design stage aims to develop an initial design for the product to be made. The product to be developed is a digital LKPD based on problem-based learning. This design stage consists of four stages, including preparing the instrument first, choosing the right media, choosing the format, and determining the initial product design. The instruments prepared include validation instruments, assessments of product test results, and questionnaires for students. Furthermore, in selecting the LKPD format, it must be adjusted to good and correct criteria. In developing this product, researchers used a problem-based learning approach based on the components of the learning design that have been determined. At this stage, the researcher creates a storyboard first to make it easier to develop the product. The application used in designing the product is the Canva application, and then the LKPD product is uploaded to the Liveworksheet website to be used as a digital LKPD. This digital LKPD can be accessed online via the Liveworksheet website. The advantage of this Liveworksheet website is that students can work on worksheets directly without having an account; the results of the scores they get can be seen after they work on the worksheet.

Development stage, after the Student Worksheet has been designed, the next step is to develop the LKPD product and test the validity of the LKPD with several experts. The requirements for testing the suitability of LKPD must refer to didactic requirements or content suitability, construction requirements and technical requirements. As for the results of the validation tests for several experts, media experts got a score of 92.50%, language experts got a score of 87.50% and validation tests for material experts got a score of 97.50%. Meanwhile, the one to one product trial obtained a score of 89.17% and the small group trial obtained a result of 91.33%. The following is a visualization of student worksheets based on problem base learning. In the Cover section there is the LKPD title, the lesson content, namely Science, and an identity column that students must fill in. The next page contains instructions for using the LKPD which consists of

5 stages. This student worksheet also includes material regarding the human respiratory system as well as learning videos that provide a deeper understanding of science learning concepts. Not only that, the worksheets are designed interactively, where students can actively participate in learning. Students can drag and drop in the columns provided, draw lines according to the correct statements and train their thinking processes in solving problems related to everyday life. Digital LKPD based on problem based learning in science learning is shown in Figure 2.

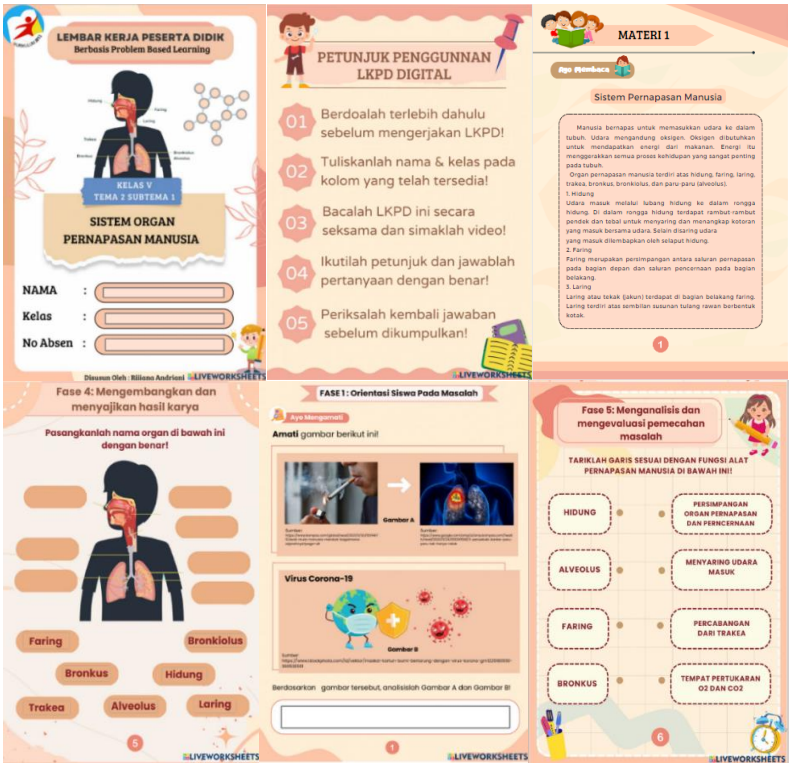

Figure 2. The Digital LKPD Based on Problem Based Learning in Science Learning

After product development has been completed, testing includes individual testing, small group testing, and expert judgement testing. As for the individual test involving 4 students, the test was carried out in a small group involving 10 students. Expert judgement consists of media experts, material experts, and language experts. Results are shown in Table 8.

Table 8. The Individual Trial Results (One To One)

No	Respondent Names of Class V Students at SDN Cipinang Melayu 05 AM	Earned Score	Maximum Score	Product Rating Percentage
1.	M.S	58	60	96.67%
2.	R.A	55	60	91.67%
3.	SB	50	60	83.33%
4.	AH	51	60	85.00%
Average Percentage				**89.17%**

This individual test involved four class V students at Cipinang Melayu Elementary School, including: Masya Sahryna, Reva Aulya, Salsabila Bilqis, and Ammar Haidar. Before carrying out individual tests, the researcher first explains what product is being developed, then the students are asked to work on the worksheet that has been provided and fill out a questionnaire regarding the product being developed. There are 15 questions in the questionnaire using a rating scale of 1-4, so a maximum score of 60 is obtained. Based on the results of the one to one recapitulation results obtained an average percentage result of 89.17%, which is included in the very good category. The results of small group trials are shown in Table 9.

Table 9. The Results of Trials in Small Groups (Small Group Evaluation)

No	Respondent Names of Class V Students at SDN Cipinang Melayu 05 AM	Earned Score	Maximum Score	Product Rating Percentage
1.	AF	59	60	98.33%
2.	RS	57	60	95.00%
3.	M.F	54	60	90.00%
4.	SQ	58	60	96.67%
5.	FC	56	60	93.33%
6.	R.I	50	60	83.33%
7.	C.A	49	60	81.67%
8.	NA	52	60	86.67%
9.	DQ	55	60	91.67%
10.	ZA	58	60	96.67%
Average Percentage				**91.33%**

Based on Table 9, the results of the small group test involving 10 students who were not included in the individual test. The following are the names of those who took part in the small group trial, including: Anara Fauziah, Ramadhan Sukma, Muhammad Fairus, Shafira Qulubina, Felicia Charisma, Rakha Indra, Christabel Azalia, Naufal Adzka, Damia Qaisara, and Zahra Aulia. The researcher first explains the product that will be used. Next, students are asked to work on the worksheet and fill out the questionnaire that has been provided. There are 15 questions in the questionnaire using a rating scale of 1-4, so a maximum score of 60 is obtained.

Based on the results of the small group trial, which obtained an average percentage score of 91.33%, it can be concluded that the results obtained were included in the very good category. The results of the expert judgment recapitulation are shown in Table 10.

Table 10. Expert Judgment Recapitulation Results

No	Expert Judgment Respondents	Product Rating Percentage
1.	Media Expert	92.50%
2.	Materials Expert	97.50%
3.	Linguist	87.50%
Average Percentage		**92.50%**

At the material expert test stage, the aim is to see to what extent the science learning material is in accordance with the learning objectives. The material expert test involves one expert. Then the media expert test is carried out, which is needed to find out to what extent the media that has been designed is appropriate and appropriate to the stage of development of fifth grade elementary school students. The language expert test aims to find out the overall use of the language according to the development of class V students. The recapitulation results from expert judgment consisting of media experts, material experts, and language experts obtained an average percentage score of 92.50%. These results are included in the very good category.

Disseminate stage: this stage aims to disseminate digital LKPD development products to students, especially class V and class teachers at SDN Cipinang Melayu 05 Pagi. This stage is the final stage in developing digital LKPD products, and based on the results of expert judgment, this LKPD is suitable for use. This student worksheet is distributed via a link with the help of the liveworksheet website. Students can work directly on the link, and they can also see the results they get after working on it.

Discussion

Based on the results described above, student worksheet development is categorized under very good criteria. This research aims to develop student worksheets based on problem solving. Researchers use a 4-D approach, which consists of four stages, including: define, design, develop, and disseminate. The development of digital LKPD has the advantage of making learning interactive and increasing the role of students in actively participating because this digital LKPD is designed using the Liveworksheet website, which can be done directly by students. Not only that, in this digital LKPD there is also material about the human respiratory system and ways to maintain human respiratory organs, which can help students understand the material.

In this LKPD, the questions given are problem-solving based, so that they can train students in critical thinking and solving problems. Clear instructions or steps for using digital LKPD can make it easier

for students to learn (Irawati & Setyadi, 2021; Shinta sunny et al., 2022).This worksheet is designed by adding images that match the material, and in this worksheet there is also a learning video that adds insight (Anisa, 2017; Wahyuni et al., 2021). This LKPD utilizes the Liveworksheet website application where the scores obtained can be seen directly by students. Educators don't need to bother checking student assignments because the scores are already recorded in the application. Therefore, the development of digital LKPD is very suitable for use and can help the learning process take place.

In general, digital student worksheets can be used as supporting teaching materials in science learning, especially in class V elementary schools, which can be done independently and provide implications for elementary school teachers and future researchers to develop teaching materials, especially PBL-based digital LKPD. This student worksheet presents problems related to the human respiratory system so that students can think critically and explore their abilities to solve problems related to everyday life. Students are also able to understand science learning concepts related to material on the human respiratory system. Researchers realize that the LKPD development product is still far from perfect, so improvements are needed that are guided by research procedures.

The difference between this research and previous research is that this research is devoted to developing digital student worksheets based on problem-based learning in class V; apart from that, the LKPD material is on the human respiratory system. Apart from that, this worksheet was designed digitally using the LiveWorksheet website. The aim of this research is to test the validity of the worksheet and whether it is suitable for use in the learning process. The limitation of this research is that the worksheet is digital-based, which requires an internet data package to access the live worksheet web. Apart from that, many students still have difficulty answering questions on the website, and when it is implemented in class, there are still students who are busy chatting with their friends because they don't understand how to work on the worksheet. Solutions that can be taken include ensuring that each student has an adequate internet quota, guiding students more in the process of working on digital LKPD, and reprimanding students who are still busy chatting with their friends. Digital student worksheets based on problem-based learning can be used as a reference or point of reference for future researchers, especially those who want to develop products for developing digital student worksheets based on problem-based learning.

4. CONCLUSION

The development of digital LKPD based on problem-based learning using a 4-D approach is very suitable to be used to improve children's thinking process abilities in solving problems. This can be proven from the results obtained by several expert judgments, including those obtained by material experts, language experts, and media experts who obtained scores in the very good category. This digital worksheet utilizes a live worksheet platform, where the worksheet is designed in an interactive and fun way. Students can also directly find out the results of the scores they get. Based on the description above, the implications of developing student worksheets can be used as one of the teacher's teaching materials to support the learning process in the classroom. With digital LKPD based on problem-based learning, students can solve problems that exist in everyday life, especially in science subjects. This research has limitations in terms of time to design products. When working on digital LKPD, there are still students who have network problems. It is hoped that future researchers who develop digital student worksheets can become a reference in developing similar products and can develop interesting and better digital LKPD products.

5. REFERENCES

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