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Development of science LKPD based on inquiry training on HOTS-science literacy skills

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ABSTRACT

LKPD circulating in schools mostly does not contain experiments, demonstrations or discussions. This research aims to produce worksheets for students as teaching materials used in the science learning process, thereby creating maximal learning activities that provide space for students to be active in thinking through inquiry-based learning activities, thus improving students' HOTS-Science Literacy. This study is development research using the ADDIE development model (analysis, design, development, implementation, and evaluation), with the research subjects being fifth-grade students of SDN 060874 Medan. The research instruments used were validation questionnaires for expert validators and student response questionnaires regarding the practicality of the resulting product. The results obtained from the research show that the Inquiry Training-Based Science Worksheet is in the highly valid category, with percentages for three consecutive worksheets being 96 percent, 98 percent, and 97 percent based on the assessment from expert validators. The practicality test was analyzed based on student responses, with an average score of 78.7 percent, which falls into the practical category. Based on the results of the data analysis, it was concluded that the Science LKPD based on Inquiry Training was valid and practical to be used as alternative teaching material for teachers to improve the ability of HOTS-science literacy of grade V elementary school students.

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ABSTRAK

LKPD yang beredar di sekolah kebanyakan tidak memuat kegiatan eksperimen, demonstrasi maupun diskusi. Penelitian ini bertujuan untuk menghasilkan lembar kerja untuk peserta didik sebagai bahan ajar yang digunakan di dalam proses pembelajaran IPA sehingga terciptanya aktivitas belajar yang maksimal dalam memberi ruang kepada peserta didik untuk aktif dalam berpikir melalui kegiatan pembelajaran berbasis inquiry training sehingga meningkatkan kemampuan HOTS-Literasi Sains peserta didik. Penelitian ini merupakan penelitian pengembangan dengan model pengembangan ADDIE (Analysis, Design, Development, Implementation, and Evaluation) dengan subjek penelitiannya adalah peserta didik kelas V SDN 060874 Medan. Instrumen penelitian menggunakan lembar angket validasi untuk ahli validator dan angket respons peserta didik terhadap kepraktisan produk yang dihasilkan. Adapun hasil penelitian yang diperoleh menunjukkan LKPD IPA Berbasis Inquiry Training berada pada kategori sangat valid dengan persentase kepada tiga LKPD berturut-turut 96 persen, 98 persen, dan 97 persen berdasarkan penilaian dari ahli validator. Uji kepraktisan dianalisis berdasarkan respons peserta didik dengan perolehan rata-rata skor sebesar 78,7 persen yang berada pada kategori praktis. Berdasarkan hasil analisis data tersebut disimpulkan bahwa LKPD IPA berbasis Inquiry Training telah valid dan praktis untuk digunakan sebagai bahan ajar alternatif bagi guru dalam upaya meningkatkan kemampuan HOTS-literasi sains peserta didik kelas V SD.

Kata Kunci: *HOTS-literasi sains; inquiry training; IPA; LKPD*

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INTRODUCTION

Learning in the 21st century requires students' critical thinking based on field facts through the application of 4C skills, such as Communication, Collaboration, Critical Thinking and Creativity and Innovation (Dewi & Meilina, 2022). Ilmu Pengetahuan Alam (IPA) is not just a way of working, seeing, and thinking, but science as a way of knowing, meaning that science as a process can also include attitudinal or action tendencies, curiosity, habits of mind, and a set of procedures (Muryanti, 2023). IPA learning is a field of study of the universe to reveal all phenomena that occur in nature through real disclosure activities with a set of procedures. The teacher's role as a facilitator is defined as providing facilities to facilitate students' learning activities. IPA learning that emphasizes providing direct learning experiences is expected to foster the ability to think, work, behave scientifically, and communicate as an important aspect of life skills. The learning process will involve students' thinking skills through searching, finding, and using their knowledge to understand a scientific concept (Andini & Azizah, 2021). Learners with high-level thinking will be able to analyze problems and find solutions to these problems; such a level of thinking is needed because of increasingly complex competition and the emergence of discoveries (Pebriani et al., 2022).

Having science literacy HOTS skills is the main goal in science education. Science education plays an important role in preparing students to have science literacy. It has been emphasized that science literacy is one of the characteristics of citizens that meet today's needs (Wahyu et al., 2020). The 2018 Programme for International Students Assessment (PISA) test results show that the literacy skills of students in Indonesia are still low. Indonesian students' average science literacy score is 396, which is still below the score set by the OECD, which is 489. Indonesia is ranked 9th at the bottom for science assessment aspects compared to other countries. According to PISA, Indonesian students' average science literacy score for three consecutive years, 2006-2018, is 393, 383, 382, 403, 396. (See: https://www.oecd.org/pisa/publications/pisa-2018-results.htm). Literacy skills are important for students because these abilities are also factors that can affect the effectiveness of learning implementation (Ghifari et al., 2022). To train this ability, of course, Lembar Kerja Peserta Didik (LKPD) is needed to support this ability. Lembar Kerja Peserta Didik is a printed teaching material that contains a summary of the material, as well as a series of structured activities with clear implementation instructions that students must complete to understand the teaching material, which refers to the fundamental competencies that students must achieve through investigation and problem-solving activities. Utilizing worksheets for students as teaching materials encourages students to more easily understand learning material, with the teacher's job of guiding students so that the learning process remains directed (Siregar & Siregar, 2020). Combining worksheets for students with learning models will create more structured learning and increase students' curiosity in depth to find scientific concepts in the learning process through LKPD based on learning models..

The development of LKPD with a learning model orientation not only refers to mastery of concepts, but is also expected to develop skills in scientific performance. In this case, inquiry training can improve students' understanding of science, creative thinking, and skills to find, process, and analyze information (Mutlu, 2020; Suchyadi et al., 2020; Uğur et al., 2020). Inquiry training offers inquiry learning that is integrated, planned, and guided by the teacher to help learners understand the concepts of knowledge and skills needed in everyday life (Rozali, 2024). Subject integration makes it easier for learners to learn systematically by the skills they need in the 21st Century (Hendriana, 2023).

The use of LKPD is expected to help students in the learning process and increase the enthusiasm of students' learning, which is expected to improve students' learning outcomes. However, most of the LKPD circulating in schools do not contain experimental, demonstration, or discussion activities. Previous research suggests that many teachers still use conventional LKPDs, which are instant, use

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them, and buy them from publishers without trying to prepare, plan, and make them themselves (Istiqomah, 2021). This can mean that the LKPD used is not interesting, less contextual, dull, monotonous, and does not follow the needs of students. So, the student worksheets used cannot support the HOTS-Literacy Science ability of students in the learning process. Using student worksheets as teaching materials encourages students to more easily understand learning materials, with the teacher's task of guiding students so that the learning process remains directed (Siregar & Siregar, 2020).

The learning experience through the use of student worksheets based on the inquiry training model will make it easier for students to build their knowledge in the cognitive dimension, which will result in improved learning outcomes. This study aims to produce Inquiry training-based science LKPD to improve the HOTS-Literacy Science skills of Learners, as stated in the research findings, which state the need for teaching materials that are easy and efficient to apply and understand by students in the form of model-based LKPD in learning (Ayuni & Tressyalina, 2020). Previous research shows that E-LKPD development is needed to facilitate students' critical thinking process and is interactive. In contrast to these studies, this research was conducted as a product development that aims to produce science LKPD based on the inquiry training learning model on the HOTS-literacy ability of science students (Hasanah et al., 2023). This LKPD is a novelty with differences from previous research, namely combining HOTS abilities and science literacy through learning using LKPD with an inquiry training model, and developing innovative LKPD as teaching materials is essential for students to meet the demands of 21st-century learning (Suryaningsih & Nurlita, 2021).

Based on information from interviews with class teachers at SDN 060784 Medan, it was found that several students had difficulty mastering science learning concepts, which resulted in low learning outcomes. In addition, no space is given to students to actively obtain learning concepts, so learning at SDN 060784 Medan has not stimulated students to think at a high level (HOTS). As well as in science learning that is carried out, it does not require students to develop problem-solving skills because, in the learning process, the teacher has not used LKPD as a supporting learning tool. Hence, students' science literacy skills are still low. Based on this review, it can be seen that in science learning, LKPD is needed in combination with a learning model to support students' HOTS-science literacy skills; in this case, the inquiry training learning model is used. So this research aims to produce inquiry training-based science LKPD that is valid and practical to support students' HOTS-literacy science skills.

LITERATURE REVIEW

HOTS-Science Literacy Skills

High-level thinking skills, or HOTS, are defined as the ability to think, recall information, and solve problems through the ability to analyze, evaluate, and create. Science literacy is a person's ability to understand science, communicate science (oral and written), and apply science knowledge to solve problems, to have a high attitude and sensitivity to themselves and their environment in making decisions based on scientific considerations (Narut & Supardi, 2019). The Organization for Economic Co-operation and Development (OECD) defines three main domains in science literacy assessment: contexts, scientific competencies, and scientific knowledge. The Programme for International Student Assessment (PISA) defines three scientific competencies in assessing science literacy: explaining phenomena scientifically, evaluating and designing scientific investigations, and interpreting scientific evidence and data (see **Figure 1**).

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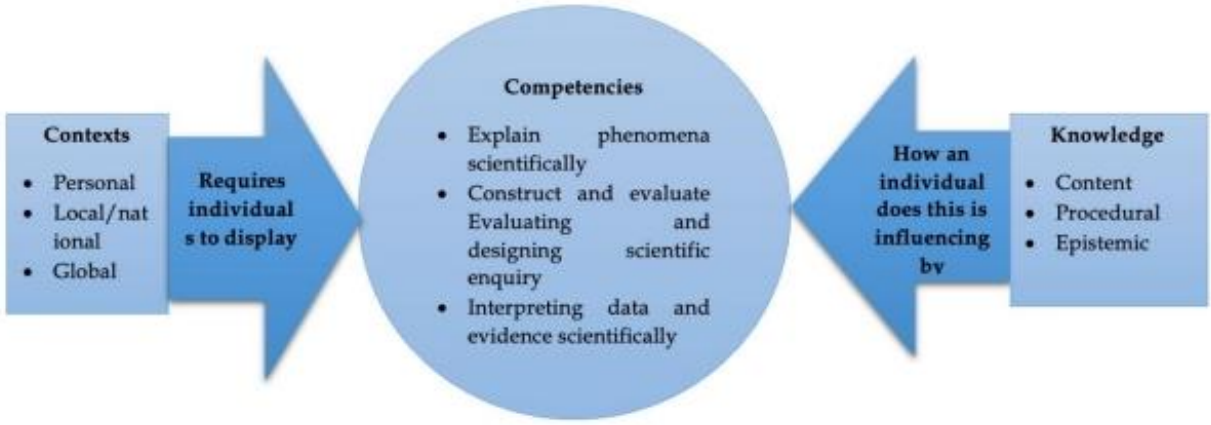

Figure 1. Science Literacy Framework 2015/2018
Source: OECD in PISA Assessment and Analysis Framework 2018

The three aspects of science literacy competence, namely explaining scientific phenomena scientifically, designing and evaluating scientific investigations, and interpreting data and evidence scientifically, are divided into three types of knowledge: low, medium, and high. The low level is the ability to mention simple facts or concepts. The medium level includes the ability to use conceptual knowledge to explain phenomena. Wasis et al in the book "HOTS & Literasi Sains: Konsep, Pembelajaran dan Penilaiannya" outline the levels of HOTS-Science Literacy, where high levels include the ability to analyze complex information, synthesize evidence, evaluate, and design problem-solving. If a comparison is made with Bloom's taxonomy, the low level is equivalent to C1; the medium level is equivalent to C2 and C3; and the high level is equivalent to C4, C5, and C6. Then, the results of comparing HOTS literacy science are illustrated in **Table 1** below.

Table 1. HOTS-Science Literacy Indicator

HOTS Level	Indicator	Science Literacy Level	Literacy	Indicator
C4	Analyze	High level	Learners can work with models for complex situations and can solve complex problems.	Analyze Complex Information
C5	Evaluate		Learners can work effectively with models and can select and integrate representations.	Synthesize and evaluate
C6	Create		Learners use reasoning, make generalizations, formulate, and communicate their findings.	Design a solution

Source: HOTS and Science Literacy Comparison Results

Inquiry Training Learning Model

The inquiry learning model is a series of studies involving all students to think carefully, analogically, and systematically to solve the problems they face (Sugianto et al., 2020). The Inquiry Training learning model is defined as a learning model designed for students in the learning process to be able to investigate, explain, and form new knowledge through problem or question formulation activities, investigating unusual phenomena through the thinking process. The focus of the inquiry training learning model is to help learners develop intellectual discipline and skills in asking questions and seeking answers that come from curiosity. There are five phases of the inquiry training learning model. The following syntax of the inquiry training learning model is shown in **Table 2**:

Table 2. Syntax of Inquiry Training Model

Stage	Model syntax	Model syntax description

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Stage	Model syntax	Model syntax description
1	Confront the problem	a. Explain research procedures b. Explain the differences
2	Data collection verification	a. Verify the nature of the object and its condition. b. Verifying events from the problem state
3	Experiment data collection	a. Separating relevant variables b. Hypothesize and test causal relationships
4	Processing and formulating an explanation	Formulate rules and explanations
5	Analyze the research process	Analyze research strategies and develop the most effective ones

Source: Yuliska et al (2020)

The advantages of the inquiry training learning model as an inquiry learning strategy are learning strategies that it emphasizes the development of cognitive, affective, and psychomotor aspects in a balanced manner. This learning model will create meaningful learning. The development of students' behavior considers inquiry learning because of the learning experience. Inquiry learning provides materials and problems for the investigation process to solve problems, and the inquiry learning process can meet the needs of students according to each student's learning ability (Fuadaturahmah, 2018).

Lembar Kerja Peserta Didik (LKPD)

Lembar Kerja Peserta Didik (LKPD) and Lembar Kerja Siswa (LKS) are learning tools with the same meaning. LKPD contains sheets containing tasks that students must do in the form of work instructions to complete a task following the basic competencies to be achieved (Lathifah et al., 2021). LKPD is a teaching material that contains student activities in the learning process. Kosasih in “Pengembangan Bahan Ajar” explains that LKPD is included in simple teaching materials because its main component is not a description of the material, but contains several activities that students can carry out by learning objectives. Judging from its structure, LKPD teaching materials are simpler than the modules. However, it is more complex than books. Prastowo in the book “Panduan Kreatif Membuat Bahan Ajar Inovatif" outlines six main elements of LKPD, which are (1) title; (2) learning instructions; (3) basic competencies or subject matter; (4) supporting information; (5) tasks or work steps; and (6) assessment. Meanwhile, when viewed from the writing format, LKPD contains eight main elements, consisting of (1) title; (2) basic competencies to be achieved; (3) completion time; (4) equipment/materials needed to complete the task; (5) brief information; (6) work steps; (7) tasks to be done; and (8) reports to be done. To create a science learning process, one of the things that can be done is a practicum.

METHODS

The type of research used is development research, that is, Research and Development (R&D). The Research and Development method is a research method that produces products in specific fields of expertise, which are then tested regarding the effectiveness of the products developed. The product produced in this study is teaching material in the form of Lembar Kerja Peserta Didik (LKPD) based on the inquiry training learning model on the HOTS-literacy ability of science students for grade V SD / MI, which has valid and practical qualifications. In this study, researchers used the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE development model has stages starting from needs analysis, product design, teaching material development, field implementation, and evaluation.

The data in this study consisted of two types, the first is quantitative data in the form of scores from the validation assessment of LKPD teaching materials by expert validators as many as one expert in the field of science and the score of student response questionnaires in assessing the practicality of LKPD

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teaching materials distributed to 25 fifth grade students. The second is qualitative data obtained from the description of suggestions or input, responses, and criticisms from expert validators related to the LKPD teaching materials developed to make improvements to the product. The data collection technique used in this research is a questionnaire. The questionnaire sheet is used to validate the products that have been developed and to determine the students' responses to the products developed. The results of the two data analyses will determine the development product's validity and practicality levels in the form of science LKPD based on the inquiry training model for grade V SD / MI. The formula used to calculate the level of validation and practicality of the resulting product is:

The formula used for the validation level is:

$$P = \frac{\text{Total Number of Respondents' Answers}}{\text{Total Ideal Score}} \times 100\%$$

Table 3 below shows how the inquiry training model determined the level of validity and revision of LKPD IPA development products.

Table 3. Product Validity and Revision Levels

Percentage (%)	Valid Criteria
0-20	Invalid
21-40	Less Valid
41-60	Moderately Valid
61-80	Valid
81-100	Very Valid

Source: Riduwan in "Pengantar Statistika Untuk Penelitian Pendidikan, Sosial, Ekonomi, Komunikasi dan bisnis"

Data from the response sheet was calculated using the following calculation formula:

$$\text{Practicality Level} = \frac{Total\ score\ obtained\ per\ item}{Sum\ of\ Maximum\ Score\ per\ item} \times 100\%$$

Determination of the level of practicality of the learning module can be seen in **Table 4** below.

Table 4. Practicality Criteria

No	Interval	Category
1.	80 % - 100 %	Very Practical
2.	60 % - 80 %	Practical
3.	40% - 60 %	Moderately Practical
4.	30 %- 40 %	Less Practical
5.	0 - 20 %	Not Practical

Source: Riduwan in "Pengantar Statistika Untuk Penelitian Pendidikan, Sosial, Ekonomi, Komunikasi dan bisnis"

RESULTS AND DISCUSSION

As previously explained, this module was developed using the ADDIE model R&D (Research and Development) method, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation.

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Analysis

In this analysis stage, researchers conducted interviews and observations at SDN 060874 Medan. Curriculum and material analysis, learner analysis, and learning objectives analysis were carried out in this stage. The analysis results obtained that SDN 060874 Medan in grade V has not used LKPD in the learning process in the science learning content; the curriculum used is the 2013 revised curriculum, 2017. The fundamental competencies to be developed are competencies 3.4 and 4.4 in the science content of the human circulatory system material. Learner analysis shows that the age range of learners is at the age of 11 years with a dominant visual learning style and heterogeneous cognitive abilities. Open interviews with students show that the learning only focuses on textbooks without practical activities supporting students' science skills. This became the basis for researchers to develop science LKPD to support students' practicum activities, which are expected to improve students' HOTS-literacy skills. The analysis process is carried out to determine the teaching materials teachers use, obstacles or difficulties in the learning process, and teaching materials students need to find solutions aligned with the objectives to be achieved (Arini & Sulistiyono, 2023). The activity carried out at this stage is to check the suitability of the data obtained from the interview, observation, and documentation process. If the data generated is appropriate, then the data is said to be valid (Fitriantien, 2019).

Design

In the second stage, design the developed product. The product developed in this study is Science LKPD based on Inquiry Training. The design stage is carried out by designing the appearance of the LKPD to be developed, and the draft content contained in the LKPD. The design of the LKPD to be developed contains several components, namely the title of the LKPD, Core Competencies, basic competencies, learning objectives, and learning materials, all of which will be loaded following the procedure of the inquiry training learning model activities. The LKPD is designed to be colorful and attractive to increase students' interest. LKPD is one of the efforts teachers can make to motivate students in implementing learning (Putra & Agustiana, 2021; Erni et al., 2023).

The applications used in developing this product are Canva and Microsoft Word. The fundamental competencies and indicators to be developed are as follows (see **Table 5**).

Table 5. Basic Competencies and Indicators of Competency Achievement

Basic Competencies		Competency Achievement Indicators	
3.4	Understand the circulatory organs, their functions in animals and humans, and how to maintain healthy human circulatory organs.	**3.4.1**	Constructing knowledge about the circulatory organs in humans and animals
		3.4.2	Analyze the function of circulatory organs in humans and animals.
4.4	Present work on human circulatory organs.	**4.4.1**	Designing props for human circulatory organs

Source: Book of Tematik Guru dan Siswa Tema 4

Development

The third stage, namely development, is when the researcher develops the draft product prepared at the design stage. After the product has been developed, the LKPD product will be validated by experts using a validation questionnaire that has been prepared. Experts will assess the LKPD according to the questionnaire using three assessment aspects: material, language, and design. Then the validator provides comments and suggestions for improvement of the developed LKPD. After going through the improvement process, the validation data is processed and then interpreted to obtain the results that the three Inquiry Training-based Science LKPD are declared very valid and feasible to be implemented at

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the field trial stage. After the product has been validated and improved (Aini et al., 2019), the product is suitable for use in the field trial.

Figure 2 shows the cover of the three LKPDs. Making is done using the Canva application.

Figure 2. LKPD Cover
Source: Research 2024

Figure 3 shows how the second page's KI, KD, Indicators, and Learning Objectives were prepared using the Canva application.

Figure 3. Display indicators and learning objectives
Source: Research 2024

The arrangement of supporting information related to the material of the circulatory system in humans on the third page can be seen through **Figure 4**.

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Figure 4. Material
Source: Research 2024

Furthermore, **Figure 5** shows students' work activities and tasks in the three LKPDs.

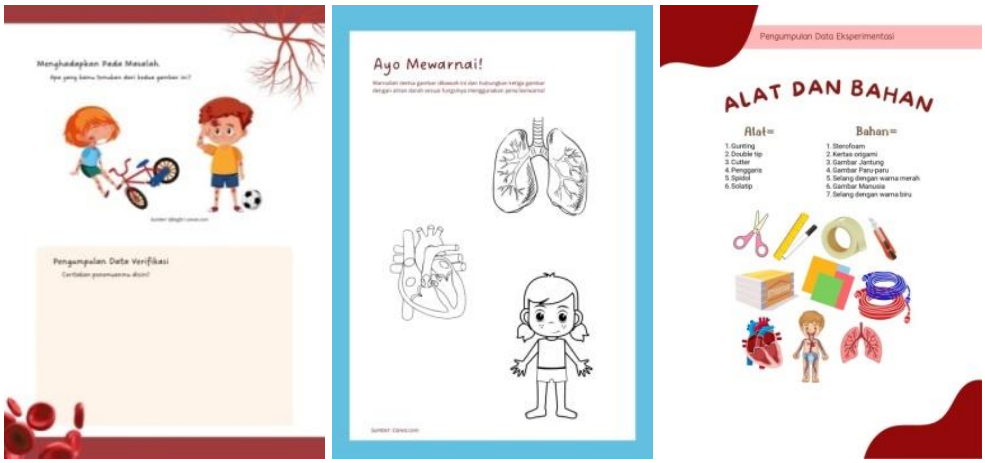

Figure 5. Work Activities and Tasks
Source: Research 2024

Implementation dan Evaluation

The next stage is the Implementation stage. At this stage, the Science LKPD product based on Inquiry Training is implemented to students in class V-B SDN 060874 Medan with 25 students in three learning meetings. The implementation stage is generally used to apply the product to determine the effectiveness, efficiency, and attractiveness of the developed LKP (Putra & Agustina, 2021). The fifth stage is the evaluation stage. At this stage, after applying the LKPD product to learning, a learning evaluation is carried out by providing a response questionnaire sheet to determine the practicality of the product that has been developed.

Analysis of Product Validity

Science LKPD, based on Inquiry Training, completed by following the ADDIE development model procedure, is then validated by expert validators related to material aspects, language aspects, and design aspects, with 33 statement items assessed by experts. Indicators in the teaching materials developed to determine the validity of the product are the identity of teaching materials, material feasibility, language, presentation, and graphics (Wulandari & Oktaviani, 2021). The validation stage is

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carried out to determine the validity of the product developed (Orkha et al., 2020; Sriwahyuni et al., 2019). Validation was carried out by experts in the field of science, with the acquisition of validation in **Table 6** below.

Table 6. Recapitulation of LKPD Validation

Assessment Aspect	Description of LKPD	Validator Score	Maximum Score	Percentage	Category
Material Aspects	LKPD 1	58	60	96,7	Very Valid
	LKPD 2	59	60	98,3	Very Valid
	LKPD 3	58	60	96,7	Very Valid
Language Aspect	LKPD 1	43	45	95,6	Very Valid
	LKPD 2	43	45	95,6	Very Valid
	LKPD 3	43	45	95,6	Very Valid
Design Aspects	LKPD 1	59	60	98,3	Very Valid
	LKPD 2	60	60	100	Very Valid
	LKPD 3	60	60	100	Very Valid
	LKPD 1	160	165	96	Very Valid
Average score	LKPD 2	162	165	98	Very Valid
	LKPD 3	161	165	97	Very Valid

Source: Research Results (2023)

The acquisition of validation in the three aspects of assessment, material, language, and design, shows a very high level of validity. The score on each LKPD in the material aspect is 58, 59, and 58, with a maximum score of 60, so that in the material aspect, the three LKPD are classified in the very valid category. In terms of language, the score is 43 for the three LKPD, with a maximum score of 45, so it is classified as a very valid category. Moreover, in the design aspect, the score on LKPD 1 is 59, and on LKPD 2 and 3 is 60, with a maximum score of 60, so it is classified in the very valid category. From the three aspects of the assessment on each LKDP, the average score with a percentage on LKPD 1 is 96%, on LKPD 2 is 98%, and on LKPD 3 is 97%, so the three LKDPs are classified as very valid in the acquisition of this stage 1 validation, so that the validation process is carried out in one stage only. Teaching materials are valid if the calculation results are >68% descriptive. The expert validator also gave several comments regarding the three LKPDs that had been developed, related to the layout of the LKPD, writing text content that was not in accordance with Indonesian language rules, which the researcher then corrected before the science LKPD product was used in the field trial stage (Mahardika & Siswoyo, 2021). After going through improvements according to the suggestions and comments from the validator, the Science LKPD Based on Inquiry Training is suitable for use at the field trial stage for fifth-grade students of SDN 060874 Medan.

Product Practicality Analysis

The practicality of the product means that the product produced is easy for students to use. Analysis of the product's practicality is based on students' response and interest in learning by using the product that has been developed, which is in the form of Science LKPD, based on Inquiry Training. Students' responses were obtained by distributing response questionnaires to 25 students in class V-B SDN 060874 Medan. The questionnaire used a Likert scale with answer options from score 1 for disagree, score 2 for neutral, score 3 for agree, and score for strongly agree with three aspects of assessment, namely cognitive, affective, and psychomotor, with a total of 13 statement items. Based on the data on

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students' responses with predetermined criteria, it is known that 7 statement items are classified in the "Practical" category with an average acquisition of 76, and 6 statement items are classified in the "Very Practical" category with an average acquisition of 82. With students' responses showing that they are in the practical and efficient range, it can be concluded that the Science-Based Inquiry Training LKPD developed is declared practical, with an average score of 78.7, classified into the "Practical" category. The following is a recapitulation of the analysis of student response questionnaire data (see **Table 8**).

Table 8. Students' Response

Number of Statements	Average Score	Category
13	78,7	Practical

Source: Research Results (2023)

It is concluded that using this LKPD in the learning process can attract students' attention to follow it and create practical learning by using this LKPD. Teaching materials significantly influence the learning process because they can support a more optimal learning atmosphere. One of the teaching materials that can be used for the learning process is the Lembar Kerja Peserta Didik (LKPD) (Andhani et al., 2021; Dewi & Meilina, 2022). The positive response of students to the science LKPD that has been developed with an inquiry model orientation can improve students' HOTS-literacy skills following the results of previous research that developed LKPD with an inquiry learning model, it can be seen that students' responses through the analysis of student response questionnaires show very good so that they can improve students' science literacy through the use of teaching materials in the form of LKPD with an inquiry model (Firmansah & Islam, 2020). The use of LKPD in the learning process will provide many benefits, including creating directed learning according to the instructions and problems to be solved simultaneously, and creating practical learning (Ansyah et al., 2021; Rahayuningsih, 2018).

CONCLUSION

Based on the research questions, findings, and discussions on the development of IPA LKPD based on Inquiry Training toward students' HOTS and scientific literacy skills, which have been presented earlier, it can be concluded that the validity of the IPA LKPD based on Inquiry Training, as assessed by expert validators, meets the validity criteria. The validation results for LKPD 1 show a score of 96,7% for the material aspect, 95,6% for the language aspect, and 98,3% for the design aspect, with an average percentage score of 96%, categorized as highly valid. In LKPD 2, the material aspect is 98,3%, the language aspect is 95,6%, and the design aspect is 100%, with an average percentage score of 98%, categorized as highly valid. In LKPD 3, the material aspect is 96,7%, the language aspect is 95,6%, and the design aspect is 100%, with an average percentage score of 97%, also categorized as highly valid. So it is concluded that the three LKPDs developed are highly valid. The IPA LKPD, based on Inquiry Training, received positive responses from students and concluded that the products produced were included in the practical category with an average percentage gain of 78,7%. The development of Inquiry Training-Based Science LPD as a learning development strategy towards HOTS-literacy Science ability becomes input and information for schools to improve the quality of learning. Moreover, become a teacher's guide in carrying out learning in schools, especially in science learning content, so that it can train students to learn independently and enhance their learning experience. It can also serve as an alternative teaching material for teachers to be used in the learning process by using IPA LKPD based on Inquiry Training, aiming to improve the HOTS-science literacy skills of fifth-grade SD students. For future research, it is recommended to conduct effectiveness testing of the developed LKPD product by

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administering tests to observe changes in students' HOTS-science literacy skills before and after implementing the LKPD in the learning process.

AUTHOR'S NOTE

The authors declare that there is no conflict of interest related to the publication of this article and emphasize that the data and content of the article are free from plagiarism.

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