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Development of Literation Learning Devices Science Based on Local Wisdom

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Abstract: Lack of learning resources is a problem found at SDN Pantan New Area of South Aceh. This makes Literature a curriculum, especially literacy science based on local wisdom in the learning process is important to develop. This research aims to design device learning scientific literacy based on local wisdom and testing feasibility a scientific literacy learning tool based on local wisdom in South Aceh. This research method is research and development that refers on 4D models that is Define (Definition), Design (Design), Develop (Development), Disseminate (Spread). Research result show that the feasibility of science-based literacy learning devices South Aceh's local wisdom was assessed by the media validator obtaining 87.5% in the "Very Eligible" category, the results of the material validation obtained feasibility assessed 91.16% with the category "Very Eligible", and language validation results obtained 85.25% in the "Very Eligible" category. Thus can it was concluded that the learning device products developed were feasible to use in the process learning.

Keywords: Scientific, Literation Learning Devices Science, Local Wisdom.

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INTRODUCTION

Scientific Literacy is ¹ competency that students must have in the 21st century to face global competition. Literacy ability is a fundamental thing that must be possessed by students in facing the global era to be able to meet needs in various situations. Scientific Literacy is the ability to ⁴ understand science, communicate science, and apply scientific abilities to solve problems. Skills that students must possess according to market needs in the 21st century consist of 16 skills which can be grouped into three categories, namely basic literacy, competence and character quality. Basic literacy represents how students apply core skills to everyday tasks. Basic literacy consists of 6 skills namely literacy skills, numeracy, scientific literacy, ICT literacy, financial literacy and cultural and social literacy. (Wisdom, 2021).

Scientific literacy can be seen from the measurement results through the PISA study which is organized by the OECD (Organization for Economic Cooperation and Development) every three years, activities carried out by the OECD aim to see the

development of scientific literacy skills in a country within a certain period of time. The OECD itself is an international organization engaged in the field of cooperation and economic development, while PISA (Program for International Student Assessment) is an evaluation activity to determine the ability and knowledge of reading, mathematics and science which is conducted for students aged 15 years, (Sutrisna, 2021). The results of the PISA (Program for International Student Assessment) study released by the OECD on December 3 2019 show that the ability of Indonesian students in scientific literacy gets an average score of 389 with an average OECD score of 489. This shows that the ability of scientific literacy is at 37 points below the ASEAN average, meanwhile the achievement of PISA literacy skills in 2018 Indonesia was ranked 10th in the bottom of the 79 countries participating in PISA. From the results of the PISA study it can be seen that literacy skills are still very low, especially in the sciences. The low ability of scientific literacy can be caused by various factors, so serious improvements are needed to improve scientific literacy skills by increasing scientific literacy supporting facilities, such as procuring relevant learning resources, procuring books based on scientific literacy, and procuring assessment instruments that can measure literacy good and true science (Kemendikbud, 2019).

To improve scientific literacy skills besides requiring student motivation, teachers also need to consider learning strategies that are appropriate to the conditions and potential of students which in the learning process focuses on providing direct experience and applying the nature of science. Improving scientific literacy means developing students' abilities to creatively utilize appropriate evidence-based scientific knowledge and skills, solve problems and make responsible decisions. From the perspective of pedagogy (pedagogie), literacy is not only a subject entity, but an indicator of the successful implementation of the curriculum. The process of pedagogy (paedagogie) which takes place through the teaching and learning process in the classroom is a process of functional interaction between teachers and students as well as between students. In the interaction process, there are two phenomena of constructing knowledge and internalizing the values of social life, (Abidin, 2017).

The results of the needs analysis that researchers got at Pantan Luas Baru Elementary School the concept of scientific literacy are very important for students to master in terms of how students can understand the environment, health, economy and other problems faced by modern society which is very dependent on technology and progress, as well as the development of science. The results of interviews with several grade IV science teachers at Pantan Luas Baru Elementary School in South Aceh District are very important for knowing the history of which students have been scientifically literate so that efforts to improve the quality of education in Indonesia can be carried out and can compete with other countries. Students' scientific competence is low because students are not trained to express opinions or ideas that are in their minds, so that when given questions related to the meaning and relevance of material to the surrounding environment students are unable. By learning science students can also develop scientific literacy that is suitable for use in theme 4 various jobs, learning 1, sub-theme 1 types of work in semester 1 with basic competencies 3.8 explaining the importance of balancing and preserving natural resources in their environment, and 4.8 carrying out activities efforts to preserve natural resources with people in the environment.

The relationship between scientific literacy and local wisdom, the paradigm of science learning always changes with the progress of science and technology. This is solely to realize learning that is often interesting and fun for students. In line with the science literacy mission, science learning should be oriented towards students by developing their contextual abilities. In this discussion, the context in question is the application of local wisdom in science learning. The steps to forming local culture-oriented science actually start from the conception of local community knowledge through activities of characterizing, sorting, formulating and compiling a basic concept of scientific knowledge through a process of merging, accommodating and interpreting, (Dian, 2022).

From the results of class IV observations at SDN Pantan Luas Baru, they have implemented scientific literacy, and this is also supported by the teacher's response⁹ which shows that they strongly agree with using learning tools in teaching science literacy based on local wisdom. Integrating local wisdom⁶ in learning according to the current curriculum. Besides that, as an effort to maintain local wisdom and as an effort to maintain the existence of local wisdom in the midst of globalization.

METHODS

This study uses¹ Research and Development research. R&D is a type of research that produces a product, not tests a theory. This understanding is in accordance with the theory put forward by Borg & Gall "educational research and development (R&D) is a process used to develop and validate educational products". We can interpret the definition of R&D from Borg and Gall that educational research and development is a process used in developi¹³ and testing a research product. According to Sugiyono, development research or (R&D) is a basic research activity to obtain information on user needs, then proceed with development activities to produce products and examine the effectiveness of these products (Abdillah, 2021).

This research model uses a 4D model research procedure. The 4D model is Define, in this stage it is carried out to find problems, weaknesses or a condition that is the driving force behind the development activities of a product, by collecting as much data and reality as possible. At this stage it is expected to get comprehensive information related to students and materials, so that it can be used as a basic idea submission so that a product can be designed.

Design, the design phase is carried out by designing/designing device scientific literacy learning that will be developed. Furthermore, at the design stage, the elements needed in the learning device are determined. At the design stage the researcher will collect references for the development of learning tools that are in accordance with basic competencies.

Develop, The development stage is a step to realize the product that has been developed. The stages of developing the instrument are carried out based on the draft that has been prepared, then the assessment instrument will be validated by the lecturer. In the instrument validation process, the validators will provide an assessment in the form of a feasibility test on the instrument being developed and provide suggestions and comments on the contents of the instrument used as a reference for improvement. The validation process is carried out until the final product is declared fit for use (product trials on a small scale) in learning activities. In the validation process the researcher also analyzed the data to obtain a validation value so that a validation value was obtained which stated whether the product being developed was feasible or not for use by students.

³ Dissemination, The Dissemination stage is the final stage in developing a 4D model. The dissemination stage is carried out to promote product development so that it can be accepted by users, both systems, groups and individuals.

Data collection techniques in this study used a validation sheet. The validation sheet used in this development is to obtain suggestions, criticisms and responses to the local wisdom-based scientific literacy instruments being developed. To find out the validity of the developed local wisdom-based scientific literacy instruments. The researcher gave a validation sheet to the validator to be assessed by placing a tick in the appropriate row and column, writing revised items if there were deficiencies and filling in the suggestions section if there was input from the validator. The validator's assessment of the development of local wisdom-based scientific literacy assessment instruments consists of 4 categories, namely very good (4), feasible (3), less feasible (2), not feasible (1), (Wilis, 2021).

An assessment instrument based on local wisdom was developed in order to be able to relate science concepts to the field of culture, so that students' literacy skills

increase with the discourse presented in the developed instrument. The development of scientific literacy instruments relates material to nutmeg plants. local wisdom-based scientific literacy instruments are Instrument that link science material with science material in an assessment context in learning, (Musrotin, 2019).

RESULTS

The design stage of the South Aceh Local Wisdom-Based Science Literacy Learning Toolkit can be described as follows:

1. Define

At this defining stage the researcher first finds problems related to the needs of students. Needs analysis was carried out by observing students and teachers at SDN Pantan Luas Baru in grade IV, information was obtained that during the learning process the learning resources used did not relate the material to the local wisdom of the area where the students lived.

The researcher developed a learning tool, namely a scientific literacy learning tool based on the local wisdom of South Aceh which attracted students' interest because there were many pictures and stories that children liked. Apart from that, this learning tool also displayed the local wisdom of the area where the students themselves lived so that learning did not bored.

2. Design

The design stage is a continuation of the definition stage. Learning devices will be arranged according to a predetermined theme. As for the design of the learning device components arranged based on the description at the definition stage, namely:

- a. Cover page, there are differences before and after revision according to the suggestions given by the validator. The form of the suggestion is that the pictures and colors on the cover can attract students' interest in learning, and are appropriate based on the contents of the learning device.



FIGURE 1. Cover Design

- b. Guidelines for using learning devices are instructions for using learning devices that have been made. In this book there are several instructions, namely, the delivery of KD to be studied, the subjects and the time needed in the teaching and learning process.
- c. Basic Competence Mapping (KD) explains KD which will be discussed in the theme book. Then it is developed based on the lessons that will be learned at each meeting.
- d. Material focuses on scientific literacy material based on the local wisdom of South Aceh. Explain about preservation of natural resources in the environment found in South Aceh based on the origin of the researchers themselves.



FIGURE 2. Material

- e. Plan the implementation of learning in a short time or every meeting. In this plan the teacher uses a scientific model. In this activity, the teacher's delivery of material introduces more about the local wisdom of South Aceh where students live. With the aim of preserving and increasing students' insight into the surrounding environment and fostering a sense of care for students towards their environment.
 - f. In this learning tool, student worksheets are adapted to the areas around where students live, namely in South Aceh, making it easier for students to answer the LKPD that has been made.
3. Development

This development stage aims to produce learning tools that have been revised based on input from several groups. Product validation was carried out to obtain a feasibility assessment of the learning tools that were made so that this book could be used in world of education, especially in the area of South Aceh. The feasibility test was carried out by filling out a validation sheet made by the researcher which was given to the media, language and material fields. The following are the results of the validation and feasibility tests by para. Substance assessment was carried out by two validators. The results of the feasibility analysis of the substance of the media in this learning tool showed that the overall percentage of the media is 87.5% so that the learning device can be used as a learning tool for students in the learning process. In terms of all aspects, the highest percentage of eligibility was in the scientific literacy aspect with very feasible criteria (93.75%), the design aspect received very feasible criteria (91%), the content aspect received very feasible criteria (87.5%). And finally, the aspect of local wisdom gets the appropriate criteria (78%) with lower eligibility than other aspects. Suggestion What is filled in by the media validator is writing consistency and tidiness, image resolution must be increased and the type of paper used for the cover must be thick and not easily damaged so that it looks more attractive.

The feasibility analysis is carried out based on the assessment of the material in terms of the suitability of the material with KD, the accuracy of the material, the updating of the material, the presentation techniques, the support for the presentation and presentation of learning. Substance assessment was carried out by two consisting of one lecturer and one elementary school teacher in their field. the results of the analysis of the feasibility of media substance in this learning tool show that the overall percentage of the material is 96.16% so that the learning tool for scientific literacy based on local wisdom in South Aceh can be used in the learning process. Overall, the aspects that get the highest percentage of eligibility are found in three aspects, namely

those consisting of six aspects of the assessment. The highest aspects are found in three aspects, namely the accuracy of the material, supporting the presentation and presentation of learning with a very feasible category (100%). Then followed by aspects of suitability of the material with basic competencies in the very decent category (95.75%). Then followed by aspects of material updating with very feasible criteria (93.75%). And the last is the presentation technique aspect with very feasible criteria (87.5%) with a lower percentage of eligibility than other aspects. Opinions and suggestions submitted in developing learning materials are so that each picture has clear descriptions and hopefully this learning device can help students in the process of teaching and learning activities.

Analysis of the feasibility of language assessment in terms of straightforward, communication, dialogue and interactive aspects, suitability for student development, and conformity with language rules. Substance assessment is carried out by two, namely one lecturer and one language teacher. The results of the feasibility analysis of language substance in this learning tool show that the overall percentage of language is 85.25% so that the language used in the South Aceh local wisdom-based scientific literacy learning tool on the theme of various jobs can be used as a learning tool for students in the learning process. Overall, the highest aspect of language in local wisdom-based science literacy learning tools for communicative, dialogue and interactive aspects, conformity with language rules with a very decent eligibility category (87.5%). Then followed by straightforward aspects with very decent category (82.5%). And the last is the aspect of suitability for the development of students with a very decent category (81.25%) with a lower percentage of eligibility than other aspects.

4. Disseminate

After trials and learning tools have been revised according to the opinions and suggestions by them. The next stage is the dissemination stage. The dissemination stage was carried out to promote the developed product to Pantan Elementary School teachers New Area. By making one of the teachers as material to perfect the learning tools that are made.

DISCUSSION

Development of local wisdom-based scientific literacy learning tools using the 4D model which consists of the following stages: a) Define (defining) this stage is analyzing problems related to the needs of students. The researcher conducted a needs analysis to obtain information related to local wisdom-based scientific literacy learning tools needed by students. b) Design (design) this stage is the initial product design process starting from the selection of media, format, initial design and preparation of validation submission tests. c) Develop (development) at this stage begins with the preparation of a book draft that can be used as a guide in developing scientific literacy learning tools based on local wisdom. The components of learning tools consist of covers, prefaces, table of contents, guidelines for using learning tools, KD mapping, syllabus, introduction, objectives, prior knowledge, activity outline, lesson plans, LKPD and bibliography. d) Disseminate stage is carried out to promote the product resulting from the development so that it is accepted by users by individuals, groups or systems by providing a validation sheet to a teacher at Pantan Luas Baru Elementary School. The teacher is used as a material validator to adjust the material to students. After the product is developed and validated by 2 media, 2 materials and 2 languages, the results are as follows:

1. Media Validation

The scientific literacy learning tools based on the local wisdom of South Aceh were assessed by two media validators consisting of Lecturers of the Madrasah Ibtidaiyah Teacher Education Study Program, Faculty of Tarbiyah and Teacher

Training at UIN Ar-Raniry. The results of the media assessment on each aspect of the assessment can be seen in the diagram.

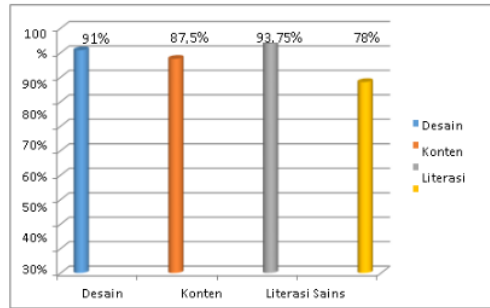


FIGURE 3. Media Validator Percentage Data

Based on the percentage results obtained from the media validator on the wisdom-based scientific literacy learning tools that can be used for the learning process. As for the design aspect, the percentage is 91%, the content is 87.5%, the scientific literacy is 93.75% and the local wisdom obtained a percentage of 78%. So that, overall the average percentage is 87.5% with a very decent category. Aspects of learning device design that discuss the suitability of learning device book sizes with ISO standards, book covers according to the contents of learning devices and for fonts do not use many combinations and are easy to read. Based on the feasibility sheet of local wisdom-based scientific literacy learning tools, the size of a good learning device must comply with ISO standards (Zakiya, 2012).

Based on the results of the previous percentage of the development of local wisdom-based scientific literacy learning tools in elementary schools conducted by Fara Diba, it was shown that the design results obtained a very decent percentage with an average score of 85.75% so that the developed learning tools were very feasible to use.

2. Material validation

Material validation results data on local wisdom science literacy learning tools obtained by 2 material validators consisting of 1 Islamic Elementary School Teacher Education Lecturer and 1 Pantan Luas Baru Elementary School teacher. The result data obtained from the 2 material validators in each aspect can be seen in the following figure.

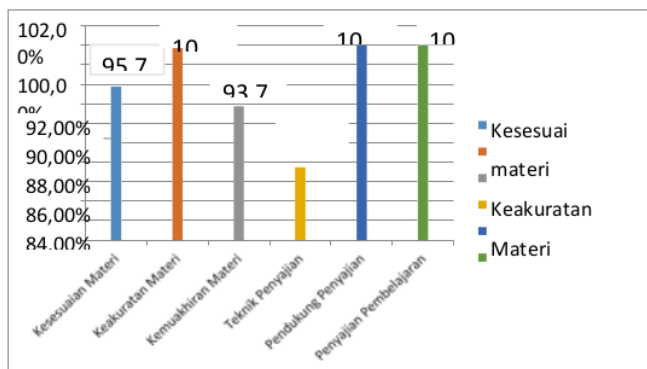


FIGURE 4. Material Validator Percentage Data

Based on the percentage results obtained from the material validity or on local wisdom-based scientific literacy learning tools that can be used for the learning process. As in the aspect of suitability of the material with KD, the percentage obtained was 95.75%, in the aspect of accuracy of the material, the percentage was obtained, namely 100%, in the updating of the material, the percentage was obtained, namely 93.75%, in the presentation technique aspect, the percentage was obtained, namely 87.5%, in the aspect of supporting the presentation obtained a percentage of 100%, and the presentation aspect of learning obtained a percentage of 100%. So that, overall an average percentage is obtained, namely 91.16% with a very decent category. Based on the results of previous research on the development of local wisdom-based scientific literacy learning tools in elementary schools conducted by Allivna, it was shown that the results of the material obtained a very high percentage. feasible with an average score of 87.5% so that the learning tools developed are very feasible to use (Allivna, 2019).

3. Language validation

Data from the results of language validation of local wisdom-based scientific literacy learning tools were obtained from 2 language validators consisting of 1 teacher of Madrasah Ibtidaiyah Teacher Education and 1 teacher of Pantan Luas Baru Elementary School. The result data obtained from 2 language validators in each aspect can be seen in the following figure.

Based on the percentage results obtained from the language validator on scientific literacy learning tools based on local wisdom in South Aceh that can be used for the learning process. As in straightforward aspects with a percentage of 82.5%, in communicative, dialogue and interactive aspects and conformity with language rules obtained a percentage of 87.5%, and in the aspect of conformity to the development of students obtained a percentage of 81.25%. So that, overall an average percentage is obtained, namely 85.25% with a very decent category.

Based on the previous percentage results for the development of language learning tools carried out by Titin, it shows that the development of language learning tools gets a very decent percentage with an average score of 82% (Titin, 2001).

CONCLUSION

The design for the development of scientific literacy learning tools based on local wisdom in South Aceh class IV at SDN Pantan Luas Baru refers to the 4D model (Define, Design, Develop and Disseminate). This learning tool is structured to contain scientific literacy based on the local wisdom of South Aceh which is developed based on the area where students live, making it easier for students to find information about various jobs. The results showed that the scientific literacy learning tools based on local wisdom in South Aceh were very feasible to use with a percentage of 87.5% from the media, from material with a percentage of 91.16% in the very feasible category, and from language with a percentage of 85.25% in the category very worth it.

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