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# Identification of Science Literacy Ability of MAN 1 East Lombok Students in Learning Static Fluid Matter Physics

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**Abstract**

This study aims to obtain an overview of the science literacy ability of MAN 1 East Lombok students in learning static fluid matter physics. This type of research is quantitative-descriptive research. The instrument used was a static fluid matter science literacy PG question totaling 20 questions. The sample in this study was class XI science three students totaling 34 students. The results showed that the science literacy ability of MAN 1 East Lombok students in learning static fluid matter physics were classified as a high category with an average percentage of 73.08%. While the ability based on competence to identify scientific problems, with an average rate of 90.20% of the type, is very high, in the competence to explain phenomena scientifically, with an average percentage of 70.22% of the high category, while in competence using scientific evidence with an average rate of 58.82% of the standard type.

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## INTRODUCTION

Based on the recommendations of the World Economic Forum in 2015, there are several 21st-century skills that the world community should have. Some of these skills are basic literacy, competence, and character. For students and educators, basic literacy is essential as capital in their lives. These critical literacies include literacy, numerical literacy, scientific literacy, digital literacy (ICT), financial literacy, and cultural and civic literacy [2]. According to the National Science Education Standards, science literacy can be interpreted as the ability of a person to ask, find and determine the answers to questions from his curiosity about everyday life. A person can describe, explain and predict natural phenomena. Science literacy allows a person to make decisions with his knowledge, including understanding science and its application to the needs of society [3].

From the PISA report, it is known that the low quality of teachers and the disparity in the quality of education in Indonesia are suspected to be the leading causes of the poor literacy skills of students. Other reasons in the learning process at school, such as the lack of use of learning media in teaching and learning activities, make students less active and less interested in the subject matter. Meanwhile, the school has adequate facilities and infrastructure to support learning, including computer laboratories, science laboratories, and LCDs, but their use has not been maximized [5]. Evaluation of scientific literacy used the formulate policies that can support the creation of competitive natural resources in the era of globalization; this is evidenced in [1] that scientific literacy is necessary for modern society.

Many factors affect the low science literacy in Indonesia, namely gender, economy, and social and immigration [4]. Research by Anjasari (2014) revealed that the cause of low mastery of science

literacy is that teachers do not get used to the learning process that supports students in developing science literacy. Based on the results of observations in the learning process, it can see that the role of teachers does not support the development of students' science literacy skills [6].

The spread of the coronavirus has recently become more widespread, with the discovery of a new variant of the new coronavirus in Indonesia called delta. This new coronavirus variant has caused more and more people to be exposed and impacted the education sector. The closure of primary education institutions to universities due to the Covid-19 pandemic has significantly influenced the learning process. The application of Physical Distancing results in the face-to-face learning process in the classroom becoming online learning. The critical role of remote and online technology information systems in education must be prepared to run the knowledge-from-home method. One alternative is to use android as a learning medium. Using android as a learning medium can be an alternative solution to make students more active in the learning process. The more active the learners will affect learning outcomes. Learning outcomes are also closely related to students' science literacy [7].

The critical role of online distance learning (online) requires adequate facilities and infrastructure for students and schools, considering that not all schools are ready to implement online learning, especially schools in rural areas with limited facilities and infrastructure to support online learning. The existing limitations will certainly cause learning outcomes to be less than optimal and impact students' science literacy ability.

Based on the presentation above and referring to the results of previous research and the effects of observations made, researchers conducted research at one of the State Aliyah Madrasahs in East Lombok to see the profile of the literacy ability of class XI science three students in learning static fluid matter physics. Based on the observations, that learning in the Madrasah has varied, but the understanding of scientific literacy is still not applied.

## METHOD

This research uses a qualitative research design with a descriptive type of research. The population of students of class XI IPA MAN 1 Lombok with a total sample of 34 students in class XI IPA 3 who will receive static fluid learning. The instrument used in this study is about the science literacy of inert fluid matter. The types of PG science literacy questions totaled 20 questions. Evaluation experts have validated the tools used. The question instruments used have adapted to static fluid physics materials. Three aspects of competence measured in science literacy are seen in table 1 [6].

**Table 1.** The spread of static fluid science literacy

| Aspects of scientific competence | Problem No. |
|---|---|
| Identifying scientific problems | 1,2,9,12,15,19 |
| Explaining the phenomenon scientifically | 3,6,7,10,11,16,17,20 |

The study's results were processed descriptively using the percentage formula [6].

$$\bar{P} = \frac{F}{N} \times 100\% \qquad (2)$$

Information $\bar{P}$: Average percentage
F: Frequency
N: Total Population

**Table 2.** Science literacy categories

| Percentage % | Category |
|---|---|

| | |
|---|---|
| 81 – 100 | Very High |
| 61 - 80 | Tall |
| 41 – 60 | Low |
| ≤ 40 | Very Low |

# RESULTS AND DISCUSSION

**Science literacy skills on the competence in identifying problems**

Indicators Identifying scientific problems in PISA 2006, states recognize possible problems for scientific investigation, identify keywords in search of scientific information, and recognize key features of scientific research [6]. The competency questions identified issues totaling six questions consisting of questions 1, 2, 9, 12, 15, and 19. Analysis of the interpretation of the scores obtained and the categories of questions can see in Table 3.

**Table 3.** Categories of competence questions identifying scientific problems

| Scientific Competence | Problem No. | % Score | Question Categories |
|---|---|---|---|
| Identifying the Problem | 1 | 97,06 | Very High |
| | 2 | 79,41 | High |
| | 9 | 94,12 | Very High |
| | 12 | 94,12 | Very High |
| | 15 | 91,18 | Very High |
| | 19 | 85,29 | Very High |
| **Average** | | **90,20** | **Very High** |

Based on Table 3, it is explained that students' science literacy ability on competence identifies scientific problems consisting of 6 questions, with an average percentage of 90.20% of the category is very high. Of the total six questions, questions numbers 1, 9, 12, 15, and 19 are in the very high class. While question number 2 is in the high category. As a result of the analysis of student's answers, researchers conducted random interviews with students after answering these questions. Most of the students responded greatly helped by the android-based learning media installed on each student's cellphone. These results confirm that android-based learning media can increase student understanding [7].

**The ability of science literacy on competence to Explain Phenomena Scientifically**

The competency indicators explain phenomena scientifically in PISA 2006, namely applying knowledge in certain situations, describing or interpreting scientific phenomena and predicting changes, and identifying descriptions that provide appropriate explanations and predictions [6]. In the questions of competence to explain phenomena scientifically, there are eight questions consisting of questions number 3, 6, 7, 10, 11, 16, 17, and 20. Analysis of the interpretation of the scores obtained and the categories of questions can see in Table 4.

**Table 4.** Categories of competence questions explain phenomena scientifically

| Scientific Competence | Problem No. | % Score | Question Categories |
|---|---|---|---|
| Explaining the phenomenon scientifically | 3 | 82,35 | Very High |
| | 6 | 61,76 | High |
| | 7 | 50 | Low |
| | 10 | 67,65 | High |
| | 11 | 58,82 | Low |
| | 16 | 82,35 | Very High |
| | 17 | 100 | Very High |

| | | | |
|---|---|---|---|
| | 20 | 58,82 | Low |
| **Average** | | **70,22** | **High** |

Based on Table 4, it is explained that students' science literacy ability in competence explains the phenomenon scientifically consisting of 8 questions, with an average percentage of 70.22% of the high category. Of the total eight questions, questions number 3, 16, and 17 are in the very high class. Questions 6 & 10 are in the high category, while questions 7, 11, and 20 are in the low sort. These results are analyzed more deeply through observation while students work on the evaluation questions based on android. Understanding and Accuracy are the fundamental problems the average student experiences in answering science literacy questions and competence in explaining phenomena scientifically.

Of the eight questions on science literacy competence explaining the phenomenon scientifically, the questions in the very high category averaged the percentage of scores at 88.23%; in the questions classified as high, the average rate of scores was 64.70%. In contrast, in the questions classified as low, the average was 55.88%.

**Science literacy ability on competence using scientific evidence**

Indicators use scientific evidence in PISA 2006 to interpret scientific evidence, make and communicate conclusions, identify assumptions, evidence, and reasons behind decisions, and reflect the social implications of scientific and technological developments [6]. In the competency questions using scientific evidence, there are six questions consisting of questions number 4, 5, 8, 13, 14, and 18. Analysis of the interpretation of the scores obtained and the categories of questions can see in Table 5.

**Table 5.** Categories of competency questions using scientific evidence

| Scientific Competence | Problem No. | % Score | Question Categories |
|---|---|---|---|
| Using scientific evidence | 4 | 85,29 | Very High |
| | 5 | 61,76 | High |
| | 8 | 35,29 | Very High |
| | 13 | 61,76 | High |
| | 14 | 55,88 | Low |
| | 18 | 52,94 | Low |
| **Average** | | **58,82** | **Low** |

Based on Table 5, it is explained that students' science literacy ability in competence uses scientific evidence consisting of 6 questions, with an average percentage of 58.82% in the low category. Of the six questions, question number 4 in the class is very high. Questions number 5 and 13 are in the high class. Questions number 14 and 18 are in a low category, while question number 8 is in a subordinate variety. Results with common types are then re-analyzed with the factors influencing the expected effects—random interviews with students who did not answer correctly on these questions. Many factors cause the lack of optimal student answers, including the content of the questions is not accommodated in the material presented in the android learning media, the level of readability of the questions, and the level of understanding of each student are also contributing factors.

Of the six questions of science literacy competence explaining the phenomenon using scientific evidence, the questions in the category are very high percentage scores at 85.29%. In questions classified as high, the average rate of scores is 61.76%. In questions classified as low, the average rate of scores is 54.41%, while in questions classified as shallow categories with a percentage score of 35.29%.

## CONCLUSION

Based on the results of research that have carried out on the science literacy ability of students in learning static fluid material physics obtained at the competence of identifying scientific problems with an average percentage of 90.20% in the very high category, on the competence to explain phenomena scientifically with an average rate of 70.22% in the high class, while in competence using scientific evidence with an average percentage of 58.82% in the low category.

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