



## Analysis of Language Literacy Skills in Biological Learning Contexts

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### ARTICLE INFO

#### Article history:

Received: 01 July 2020

Accepted: 10 Des 2020

Published: 31 Des 2020

#### Keyword:

Analysis

Biological learning contexts

Language literacy

### ABSTRACT

**Background:** The results of PISA showed that Indonesian students' literacy skills in science are still low. Until now, the cause of the problem is still little information reported. This study was conducted to analyze the language literacy skills of students in biological learning contexts. **Methods:** the methods used in the research is mixed methods research. This research involved 72 science program students who were selected by purposive sampling. The data were gained by observations, interviews, and post-test consisting of 17 questions of multiple-choice based on the Programme for International Student Assessment (PISA) indicator for language literacy in biological learning. **Results:** The analysis of language literacy in Biological learning has excellent literacy with a high category. The research showed that the highest average grade of language literacy was integrating and interpreting aspects of 75,00. Meanwhile, the lowest average grade in the reflect and evaluate aspects was 57,00. The average overall grade in the language literacy on Biological learning was 70,22. **Conclusion:** Sustainable literacy activities stimulate higher-order thinking skills, especially in the field of science, because language literacy skills can indirectly affect students' outcomes on scientific skills.

### Analisis Kemampuan Literasi Bahasa dalam Konteks Pembelajaran Biologi

### ABSTRAK

**Background:** Hasil penilaian PISA menunjukkan kemampuan literasi peserta didik Indonesia dalam bidang sains masih tergolong rendah. Hingga kini, penyebab permasalahan tersebut masih sedikit informasi yang dilaporkan. Studi ini dilakukan untuk menganalisa kemampuan literasi bahasa peserta didik dalam konteks pembelajaran biologi. **Metode:** Metode yang digunakan dalam penelitian ini adalah penelitian *mix methods*. Penelitian ini melibatkan 72 peserta didik program sains yang dipilih secara *purposive sampling*. Teknik pengumpulan data dilakukan dengan hasil observasi, wawancara dan pemberian tes setelah proses pembelajaran sebanyak 17 butir soal pilihan majemuk berdasarkan indikator *Programme for International Student Assessment (PISA)* untuk literasi bahasa dalam pembelajaran biologi. **Hasil:** Bahwa analisis literasi bahasa dalam konteks pembelajaran Biologi memiliki literasi yang baik dengan kategori tinggi. Dalam penelitian menunjukkan bahwa nilai rata-rata tertinggi literasi bahasa pada pembelajaran biologi terdapat pada aspek *integrate and interpret* sebesar 75,00 sedangkan nilai rata-rata terendah pada aspek *reflect and evaluate* sebesar 57,00. Total nilai rata-rata literasi bahasa dalam pembelajaran Biologi sebesar 70,22. **Kesimpulan:** Kegiatan berliterasi secara berkelanjutan menstimulus kemampuan berpikir tingkat tinggi khususnya dalam bidang sains, karena secara tidak langsung kemampuan literasi bahasa dapat mempengaruhi hasil capaian peserta didik pada kemampuan sains.

### Kata kunci:

Analisis

Pembelajaran biologi

Literasi bahasa



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### Introduction

The development of information quickly and globally is a 21<sup>st</sup>-century event known as the information century. The development of information is supported by the

development of technology in the field of computing to simplify human needs so that every country make demands on human resources to mobilize all mindsets or skills that can be used to adapt in the 21<sup>st</sup>-century and compete in the

international arena (Abidin et al., 2018). The rapid development in the 21st-century, especially various aspects of life, namely aspects of the economy, communication, information, transportation, technology and others. This development must be overcome by mastering 21st-century skills. Those skills are problem-solving and critical thinking, communication and collaboration, creativity and innovation (Redhana, 2019) is obtained from the ability of a person to literate.

The skills recommended to be mastered by 21st-century students are hard skills and literacy skills (Yani & Ruhimat, 2018). Then supported by (Wakhidah, 2017) that 21st-century skills need to be mastered by someone, one of which is reflective reading and writing and skilled communication both orally and in writing. Therefore, language literacy skills are needed in today's developments.

The potential for language literacy in Indonesia, according to the OECD (Abidin et al., 2018), that literacy skills in Indonesia are still in the low category based on the PISA ranking, with the 57th ranking out of 65 countries. This is indicated by the low score of 371 in 2018 (OECD, 2019). Based on UNESCO data, it is known that Indonesia has an index of interest in reading of around 0.001, meaning that of the many people in Indonesia, there is only one person interested in reading (Puspita & Irwansyah, 2018). Besides, according to (Harsiati, 2018), the results of the achievement of language literacy are still below the world average, possibly due to the relatively low reading power in Indonesia. So that in this case, the language literacy of Indonesian children is still very low compared to other countries.

Language literacy has an important role, especially in the context of learning biology to understand biology. The reason for this study using language literacy is because language skills are the foundation for intellectual growth; language literacy is an essential skill to be able to explore another course to survive in real life in society.

In fact, the potential for language literacy in Indonesia compared to the international community still not yet fulfilled the categories, either at the perfect, high, or medium levels, except at low levels. This is because there is no awareness of increasing literacy potential, both at the micro and macro levels in education (Suryaman, 2015). Low language literacy because generally students are interested in reading when needed or because of compulsion. They have not prioritized reading as a meaningful need. Usually, students prefer to be observers and listeners only during the learning process so that they have not shown their ability to explain direct understanding and think in their own way, especially in biology learning (Pamungkas et al., 2015).

According to a survey of the achievement of scientific literacy in Indonesia in each unit of PISA biology questions from 2000 to 2009, it is not that much different from PISA's

achievement as a whole. Generally, scientific literacy results are classified as the lowest score, which is below 50% of the OECD's score. The literacy of Indonesian students in biology is still below the score set from several previous years.

However, suppose the reading habit is carried out every day. In that case, it will affect the increase in literacy skills and (Howard, 2011) that those who like reading will easily understand events in the past or current social problems. Students who have high language literacy skills will also have high abilities in receiving, processing, and responding to the information received to make the right decisions when facing the problems they daily experiences. Indirectly, language skills are among the basics that affect student outcomes on scientific abilities (Hadi & Mulyatiningsih, 2009) Those are because every activity in all fields, including science, is always needed to solve life's problems.

As happened in one of the SMAN in Tasikmalaya City, many students were less interested in reading, so the school implemented a literacy movement program to read books for 15 minutes every morning to increase interest and reading. Reading activities are still not optimal so that there are still many students who have not been able to develop their literacy potential, especially in science.

The potential for low literacy of students to cause such problems is still little information to report. The purpose of this study is to analyze language literacy skills in biological learning contexts which referring to (OECD, 2013), language literacy competencies based on PISA are classified into three aspects, namely: (a) retrieving information, (b) integrate and interpret and (c) reflect and evaluate.

## Methods

This research was mixed methods research. Researchers combine qualitative and quantitative data. Qualitative data is used to determine the situation being studied through interview and observation techniques. The interview in this study aims to reveal a description of the potential for language literacy in the context of Indonesian through teachers. While the observation technique to measures the amount of respondent behaviour that cannot be measured using tests. So that researchers can observe the literacy potential of the respondents directly. The quantitative data in this study through a test technique to measure language literacy achievement in biology learning is described in the form of significant numbers (Sudjana, 1997).

The part explored in this research is the achievement of language literacy in the biological learning context at a high school in Tasikmalaya City. The language literacy test refers to the PISA literacy indicator with the following research instrument grid:

### Research Designs

This research design used mixed methods with equivalent or equal status. Researchers used qualitative and quantitative data collected simultaneously and analyzed to complement each other to obtain comprehensive, reliable, and objective data.

### Research Procedures

This research is mixed methods. Sampling by purposive sampling consisted of 2 classes totalling 72 students who were grouped into two classes based on good literacy values and had a similar score in academic and literacy.

The data collection technique was carried out through observation, interviews, and a test with 17 multiple choice

**Table 1.** Research instrument grid (Sugiyono, 2017).

Competence	Item Indicator	Item	Amount of item
Access and retrieve	Retrieving information	1,2,3*,4,5*	3
Integrate and interpret	Forming a broad understanding Develop an interpretation	6*,7,8,9*,10 11,12,13*,14,15	3 4
Reflect and evaluate	Reflecting on and evaluating the content of a text Reflecting on and evaluating the form of a text	16,17,18*,19,20 21*,22,23,24*,25	4 3
	<b>Amount</b>		<b>17</b>

questions referred to as the PISA literacy questions. To produce descriptive data in writing and orally from the observed behaviour of each respondent. According to the data obtained,

### Data Collection and Data Analysis

Data collected in the form of observations, interviews, and tests. The observations made were participatory observations; researchers were involved in the respondents' daily activities who were used as research data (Sugiyono, 2017) Table 1. In this observation, the researcher observed the school literacy activities every morning in the students.

The interview technique is then used in a preliminary study to obtain the problems being studied and obtain more specific information. In this case, an interview was conducted with a teacher in the Indonesian Language field to determine literacy potential in the school. The interview results will be interpreting, including indicators of forming a broad understanding and developing an interpretation and aspects of reflecting and evaluating, including indicators of reflecting on and evaluating the content of a text and reflecting on and evaluating the form of a text.

Data analysis from the test results of this study was carried out by examining the research sample's answers based on the PISA indicator. To obtain the final results of students' literacy skills by adding up all the scores obtained, calculating the indicator score, then converting the indicator score into a percentage value, and finally calculating the average percentage value of the indicator

for language literacy skills in the context of Biology learning (Aisyah, 2014).

To see the categories of language literacy can be found in the following Table 2.

**Table 2.** Categories of language literacy

Index Number	Category
0 - 20,00	Very low
20,01 - 40,00	low
40,01 - 60,00	medium
60,01 - 80,00	high
80,01 - 100,00	very high

(Source: Puslitjakdikbud, 2019)

## Results

### Interview Results

Based on the results of interviews at SMAN Tasikmalaya city with teachers in language studies regarding the potential of language literacy in the context of Indonesian language learning, which refers to the application of the School Literacy Movement (GLS) to increase interest and love to read learners. This is considering the low literacy potential of students in Indonesia who do not yet know the importance of literacy activities, especially the need to develop language literacy biology context that plays a close role in daily life. (Table 3). In this case, language literacy in class XI IPA at SMAN Tasikmalaya has a good reading interest, especially literacy and the activeness of students in the class.

This is evidenced by the average score for class XI IPA 1 of 91 and XI IPA 5 with a value of 93 so that the total average score of the two classes is 92 on language literacy in the context of Indonesian language learning.

### Biological Learning Context Test Results

Based on research that has been done in class XI science one and XI science 5 in one of the high schools in Tasikmalaya city on human reproductive system material, descriptive statistical data obtained as follows.

**Table 3.** The Results of a Potential Language Literacy Interview at One of Tasikmalaya City High Schools

Subject	Conversation Content
researcher:	What year is this school literacy program implemented in this high school? Do all students participate in the literacy program regularly every morning before the first hour begins?
teacher:	Since 2016, all students do literacy activities every morning, Monday to Friday.
researcher:	How long is the literacy activity?
teacher:	For 15 minutes before the first hour begins.
researcher:	Then, usually, what books are used by learners? Is it permissible if it is a textbook?
teacher:	Fiction and non-fiction books are possible, but it would be nice to use books other than textbooks to expand their knowledge.
researcher:	Are all students told to review their reading in front of their class? From the book that has been read, does there need to be a response from his classmates?
teacher:	Yes, every day there is at least one child who reviews the reading in front of his class, and that every day is expected to alternate people who study it so that everyone gets a part so that later other friends can respond to the reading contents. It should be responded to stimulate their thinking in the morning. However, some do not respond or only the child who responds.
researcher:	Are there any students who are not interested in reading books?
teacher:	Some may not be interested; therefore, it is necessary to strategize to read the book by giving an exciting award, whether it is a new fiction book or a star value with additional value in Indonesian subjects.
researcher:	Among class XI science, is the class that dominates the most and active in reviewing a book during literacy?
	Most dominating are class XI science 5, XI science 1, XI science 3.
	Where in class XI science 5 are all active average and their reading interest is a high category because generally their thinking and curiosity are high when asked to review everything has been arranged for those who will come forward to review their reading by forming a schedule so that every day turns all children get the opportunity to explain again what is understood in the reading and then who responds to it also many who ask so that here their reading interest power is relatively good.
teacher:	Then for XI science 1 XI they are the average children who are more actively active, smarter, and more critical in responding to things, including questions asked by their teachers or in literacy activities they are vying to review or respond to their reading books. The term can be said to be a class that is superior to other classes.
	For grade XI science 3 students whose categories are very active but their reading interest is encouraged to be active based on reward alone from the mother happens to be a class that mothers challenge to read reading books every week spend how many reading books for the most reading will be given an additional value. This class is active, and the literacy category is good because of the encouragement to get an award from me as an Indonesian teacher.
researcher:	Is there a list of literacy grades of grade XI science, and which classes are the best class categories?
	Class XI science 1: 91
	Class XI science 2: 90
	Class XI science 3: 91
	Class XI science 4: 90
	Class XI science 5: 93
teacher:	Class XI science 6: 90
	Class XI science 7: 90
	Class XI science 8: 90
	The class with the highest literacy value and reading interest is achieved by class XI science 5, and activeness and literacy are quite well obtained in class XI Science 1. Although XI science 3 is high in value, it is not from the interest of reading yourself but because of challenges and because of the gift
researcher:	How do I resolve to keep students' reading interest high?
teacher:	By making strategies through rewarding those who diligently read and motivate to have a high curiosity in books or literature that they do not understand.

Based on Table 4 shows that the number of samples used as many as 72 learners, with a range of 70, a minimum value of 24, a maximum value of 94, the value of the entire sample amounted to 5056, the average value of learners is 70.22 so that it belongs to the high category is at intervals of 60.01-80.00. With a standard deviation of 2,083 and variance of 17,674.

The results obtained correspond to the indicators used. There are five indicators in this instrument, the indicators include: namely a) retrieving information, b) forming a broad understanding, c) developing an interpretation, d) reflecting on and evaluating the content of a text, e) reflecting on and evaluating the form of a text.

**Table 4.** Descriptive statistics of learners' language literacy skills

	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Language Literacy	72	70	24	94	5056	70.22	2.083	17.674
Valid N (listwise)	72							

**Table 5.** Learners' language literacy achievements

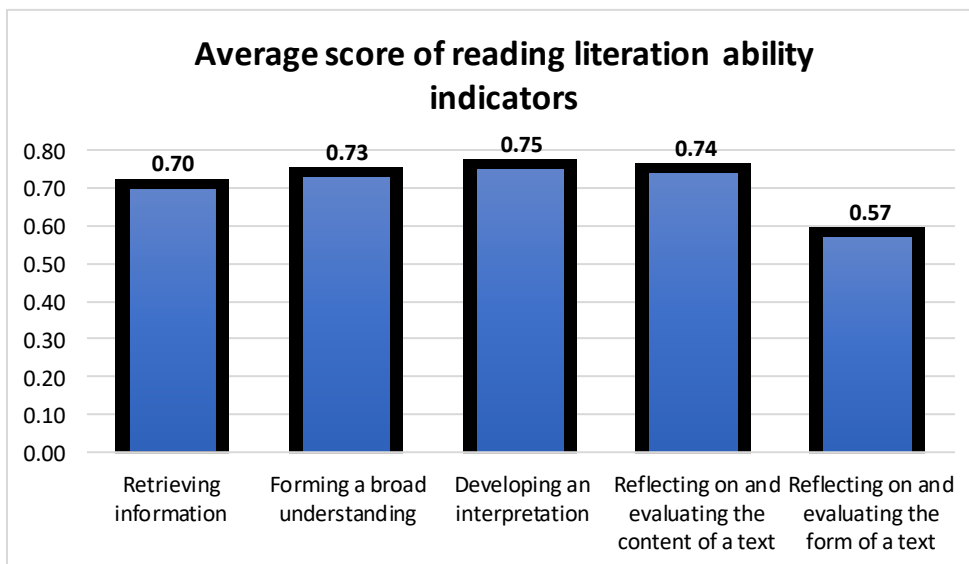
Literacy Indicators	Achievement Percentage
Retrieving information	70%
Forming a broad understanding	73%
Developing an interpretation	75%
Reflecting on and evaluating the content of a text	74%
Reflecting on and evaluating the form of a text	57%

The results obtained correspond to the indicators used. There are five indicators in this instrument, the indicators include: namely a) retrieving information, b) forming a broad understanding, c) developing an interpretation, d) reflecting on and evaluating the content of a text, e) reflecting on and evaluating the form of a text.

the content of a text, and three about reflecting indicators on and evaluating the form of a text.

**Discussion**

In an interview conducted at one of the high schools in Tasikmalaya city based on students' literacy potential in



**Figure 1.** Average Chart of Learners' Language Literacy Skills Test Scores on Each Language Literacy Indicator

Figure 1 shows the average score of literacy learners from each indicator. Obtained the highest score is in the develop an interpretation indicator of 0.75 while the lowest score in the reflecting on and evaluating the form of a text indicator is 0.57, with a maximum score of 1.00. Similarly, if converted into an average value, the highest value is 75.00, and the lowest value is 57.00.

Learners' language literacy skills (Table 5) were measured using 17 instruments of compound choice with four options. Instruments were produced based on language literacy indicators from the Programme for International Student Assessment (PISA) about the (OECD, 2013), which divided into three indicators forming a broad understanding, four indicators of developing an interpretation, four indicators reflecting on and evaluating

Indonesia who are low category, the school literacy movement program is applied.

By habituation to read both fiction and non-fiction books every morning before the first lesson begins. This way can stimulate learners' thinking ability to remember, understand, and even analyze a reading. In the literacy procedure, students read books every day in turn, one of the students asked to review the reading in front of his friends so that other students can respond to the reading content.

However, some students do not participate in literacy activities to overcome it by providing additional value and appreciation to students who have activeness in responding to reading and fond of reading. Those are so that other learners are motivated to increase their reading interest. If it is accumulated in the highest score in language



literacy in Indonesian language learning and reading activeness responding well, it is obtained an average of 91 each in class XI IPA 1 and 93 students in XI IPA 5. Therefore, Indonesian context language literacy in the school has a very high category.

Based on the Biological learning context results, the language literacy test in figure 1 shows the retrieving and evaluation aspect as the lowest cognitive level. This aspect helps obtain information explicitly factual or literal level (Musfiroh & Listyorini, 2016). This aspect includes retrieving information indicators to find and rediscover facts presented, either supporting or refuting information. According to the reading, learners can present the correct facts or refute the reading context by looking for essential information in the reading by giving attention to detailed information or outside the reading with clearly relevant references. The questions' indicators are considered more comfortable because it is based on the knowledge that is believed to be accurate and strengthened by the source of reading presented.

She was then supported by Harsiati, (2018) the ability to rediscover information as a more effortless reading ability with a percentage of 24%. However, the highest average score is not on this indicator because this skill is not always easy to understand. In principle, if it is associated with various text types, each text has a different structural form (Abidin et al., 2018). Then according to the OECD, (2013) that in accessing and retrieving information, the difficulty is only on the amount of information the reader needs and looking for conclusions in reading. So it can be said that these questions are not always relatively easy.

According to PISA; OECD, (2013), indicators of integrating and interpret aspects are forming a broad understanding and developing an interpretation. In the study (Musfiroh & Listyorini, 2016). These indicators include intermediate cognition, exciting relationships, and making conclusions between information in texts that require interpretation. According to the (OECD, 2013), by Forming a broad understanding where students should consider reading as a whole or in an overall perspective, learners can demonstrate early knowledge by identifying the main topic or general-purpose. Test results in this indicator, learners can consider the meaning and analyze the assumptions of reading in general. Then connect the reading passages into a broad understanding (OECD, 2013).

In comparison, this integration aspect is part of a high level of thinking ability that combines new information and knowledge that has been possessed to build and connect further information (Priyatni, & Nurhadi., 2017). Nevertheless, when noted, this happens because reading habituation can stimulate high-level thinking ability and affect learning outcomes (Muttaqiin & Sopandi, 2015).

Therefore, learners can form a broad understanding of the readings presented.

The learners' test results on the development of an interpretation indicator that most of the learners could conclude a reading or interpret the meaning of a word or phrase in a text. In this case, students can form conclusions or interpretations based on something outside the text conceptually through the implications or assumptions contained in the text so that it requires higher-order thinking skills (Priyatni, & Nurhadi, 2017). This thinking skill occurs because of language literacy's habituation and then strengthened according to research Enih (2010) with a penchant for reading learners to understand the content of reading to make interpretations of previous knowledge. According to Harsiati (2018), this aspect has also presented a relatively fewer text introduction than other aspects because students in Indonesia generally still have low reading resistance with long and complicated text forms. So competence with this indicator has the highest average score compared to other indicators. PISA; OECD, (2013) in language literacy competency scored highest in integrating and interpret with 56 points compared to other lower competency aspects. Therefore, learners can develop specific and in-depth interpretations of this because of the habituation of literacy every morning that stimulates learners' thinking ability.

Reflect and evaluate competence is an advanced level of cognition to integrate ideas and information in providing arguments and explanations in context (Musfiroh & Listyorini, 2016). These aspects include reflecting indicators on and evaluating the content of a text and reflecting on and evaluating a text's form. Reflecting on and evaluating a text's content in image one shows that students can describe their knowledge based on literacy activities' habituation and relatively good reading interest. This is supported that this aspect generally contains conceptual and the experience that occurs so that learners can linking information well PISA; OECD, (2013). Although this indicator is considered the most difficult, if the learner has good literacy through habituation and fondness for reading, it can improve the ability to think highly in evaluating a text. According to Archambault (Muttaqiin & Sopandi, 2015), contextual readings have an advantage because these types of readings contain a certain amount of information related to experience. Pisa's question in this indicator also measures what is already known by what learners can do from their knowledge.

Reflecting on and evaluating the form of a text in this test, the learners obtained the lowest percentage of questions on other indicators. Due to the difficulty in the lack of knowledge of learners with the introductory text, the learner has not been able to draw knowledge specifically and is narrow; therefore a deep understanding of the text is required. The lack of learners' resilience and

ability in reading texts is relatively longer than other slightly shorter indicators. The cultural schematics of Indonesian learners are still less relevant, making it challenging to understand PISA issues, mostly reflections, and evaluations. Harsiati, (2018) PISA issues are made into text that contains a relatively large number of words and complex symbols based on high-category reading culture (Harsiati, 2018). So, the learners' criticism and cleverness are still low, causing a lack of understanding of the question. This makes the real literacy stage, where many learners have difficulty in the indicator because this stage associates the meaning of the word to acquire literacy skills (Hirai et al., 2010).

Harsiati, (2018) Reflecting and evaluating the text's content is the most challenging ability compared to retrieving information. Similarly, the PISA assessment score (OECD, 2013), that the lowest score based on three aspects of language literacy competency was on reflect and evaluate with a score of 4 points because this competency is the highest cognitive level that uses advanced cognition to integrate ideas and information by giving arguments and explanations in context. As it is said, Muttaqin & Sopandi, (2015), that reflecting and evaluating is a high level of thinking ability that requires habituation of HOTS-based learning (higher-order thinking skills). As for efforts to increase high levels of thinking in learners, according to Jones (Muttaqin & Sopandi, 2015), that reading activities can stimulate high-level thinking ability. By the opinion (Hayat, 2006), language literacy is related to understanding critically-creatively various forms of discourse in real communication.

High-level thinking skills need to be trained in various ways, not only listening to teachers' knowledge but also applying continuous literacy activities to increase learners' potential and interest in Language literacy. High literacy ability is related to HOTS because literacy activities indirectly conduct high-level thinking activities. So that with good language literacy, learners can improve learners' ability to evaluate and reflect on advanced cognition. Activities that can increase advanced cognition also include reading interests, reading habits, and varied learning methods that follow the development of the 21st century (Rohman, 2017). Mastering high-level thinking ability must be based on low-level thinking ability first and mastering language literacy as an intellectual basis (Mahanal, 2019). Therefore, in modern society, language literacy competency is needed to obtain and sort information (Benson, 2002).

When viewed from the literacy category, the average value of language literacy in the context of Indonesian language learning category is very high at 92.00 at intervals of 80.00–100.00 different in the biological learning context is classified as high at 70.22 at intervals of 60.01–80.00, so in this case, there is a decrease, meanwhile, according to (PISA, (2018); OECD, (2019), language literacy and science

literacy are still low at level 1a. This difference occurs because the habituation of reading each morning that corresponds to the opinion of Fielding Howard, (2011) reading only 10 minutes each day has a positive impact on the reading test scores. So this makes reading experts realize that liberation is a complex activity. Cladwell, (2008) Revealed that "reading is an extremely complex and multifaceted process...". The process of understanding reading is not straightforward (Kintsch & Kintsch, 2005). Readers are actively involved in various processes that co-occur; therefore, it is necessary to get used to literacy activities.

The meaning and implications of language skills from the basic level to the higher as well as the development of knowledge through text, from metalinguistic grammatical analysis to the structure of written and oral texts, as human history to the social and philosophy of western education (Goody & Watt, 1963; Olson, 1991; Ong, 1992; Chafe, 1994) Even changes in human evolution are the impact of literacy thinking (Donald, 1991). So from this, though, there is an increasingly complex development of literacy.

Therefore, it is also necessary to learn methods by developing 21st century-based HOTS by involving science processes and habituation of literacy on a regular and sustainable basis to improve students' reading power resilience, especially in biological sciences. In (Wenning, 2005; Fadilah et al., 2020) opinion, several learning methods can train the thinking ability of learners to get used to doing scientific methods in solving problems and doing context literacy of Biology learning. The learning method should be student-centred, which can trigger the active thinking of learners.

Language literacy is closely related to the demands of reading skills that lead to the ability to understand information analytically, critically, and reflectively Sumbi et al., (2019) so that it will be able to adapt in the 21st century and compete in the international scene.

Therefore, the authors suggest that: (1) educators need to familiarize themselves and optimize their students to implement reading activities on a regular and sustainable basis to increase reading interest and add broad insights by being more selective about information; (2) literacy indicators in reflecting and evaluating the form of a text are still unfulfilled, from what is read is not able to apply to a problem; (3) Other researchers who will conduct this kind of research are expected to develop it by paying attention to the number of more samples and increasing the number of problem instruments, especially in each sub-indicator.

## Conclusions

Based on the research conducted, it can be concluded that the analysis of language literacy with the context of biology learning has a useful category of literacy. It is known that the value of language literacy in Indonesian

language learning reaches 92.00 (very high category), but the value of language literacy in Biology learning is obtained by an average of 72.00 (high category) so that the results of achievements decrease. This is because the school literacy movement program for 15 minutes is still not carried out optimally. Seen in learners' ability to reflect on and evaluate the form of a text indicator only obtained an average score of 57%, in contrast to the average score on developing an interpretation indicator reached 75%.

#### Declaration statement

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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