

# PISA-Like Questions on News Items: A Novel Approach to Reading Literacy

Medio Lailatin Nisphi, Zahra Alwi & Santi Oktarina

Universitas Sriwijaya, Palembang, Indonesia

Mlnisphi@gmail.com

## ARTICLE HISTORY

Received : 2022-12-08

Revised : 2023-08-01

Accepted : 2023-08-14

## KEYWORDS

*PISA Task*

*Reading Literacy*

*Students' literacy*

*News items*

*Evaluation*



## ABSTRACT

Due to PISA inconsistencies and three years of learning loss, Indonesia's new curriculum paradigm focuses on core skills, particularly reading literacy. In 2021, the minimum competency assessment (MCA) took the place of the national assessment, and since then it has had teachers and students worried about academic success. This research aims to develop valid, practical, and effective PISA-like reading questions to prepare students for the MCA. The development study was used as a grand framework of design research, consisting of a preliminary evaluation stage and a formative evaluation stage. This research involved 45 15-year-old middle school students of varied reading literacy levels. The analysis in this research was conducted qualitatively based on data from interviews, document reviews, observations, and tests to see how students worked on PISA-like reading literacy questions. This research produced valid and practical PISA-like reading literacy questions according to the PISA 2022 framework. In terms of content, the PISA-like reading literacy questions focus on topics of news items. In terms of context, students explore new situations, especially in relation to health. Student competences are measured at the application and reasoning levels. This study suggests that PISA-like reading literacy questions can be a source of inspiration for teachers in designing questions, and they can be used to improve students' literacy skills.

## 1. Introduction

Everyday life benefits from reading reasoning and problem-solving abilities because they highlight a thorough and critical reading process. Students equipped with these capacities for reason will be better prepared to meet the problems of the twenty-first century (Hesse et al., 2015; Gravemeijer et al., 2017). However, hardly are students in Indonesia accustomed to grasping what they read, using logic, or finding solutions to problems (Emelia et al., 2022; Munaka et al. 2013; Palengka, 2014). Additionally, students' lack of courage to make statements or give reasons in answering questions aggravates their problems in comprehensive reading (McKie et al., 2012; Ali, 2022).

The only learning activities and assessments that teachers have offered are of relatively low cognitive levels. This deficiency is reflected in the Programme for International Student Assessment (PISA) results for 2018, which placed Indonesian students in the fifth place out of 79 nations, with an international average literacy score of 371 out of 500 (OECD, 2018; 2019b). An explanation for Indonesian students' poor performance in reading literacy on the PISA 2018

assessment is that they are neither accustomed to reading involving comprehension and reasoning nor capable of addressing contextual problems. As a result, teachers need to adequately prepare instructional materials centered on the PISA. There is a need for learning resources that assist students in providing appropriate responses to PISA questions (Alfin, 2019; Rahmawati et al., 2019; Ali, 2014; Dizier et al., 2011).

Students in Indonesia went through a learning crisis, often known as learning loss, as a direct result of the COVID-19 pandemic, which led to a drop in academic achievement. Many different educational stakeholders have expressed interest as a result of this. As part of the rehabilitation efforts undertaken by the Minister of Education, Culture, Research, and Technology (MoECRT), the curriculum implemented in 2013 is being reformed following a new paradigm by implementing four education policy programs. In the Indonesian language, the phrase "freedom of learning" translates to "Merdeka Belajar," which refers to an initiative to improve the standard of education in Indonesia. This initiative emphasizes reading literacy as a fundamental ability (MoECRT, 2019).

The Indonesian national examination is affected by the Merdeka Belajar policy. The MoECRT decided in 2021 to replace the national examination with the MCA and a character survey for students enrolled in intermediate-level classes (MoECRT, 2019). Literacy, numeracy, and other educational traits are the primary areas of concentration of the MCA, which is a modification of worldwide assessment procedures such as the PISA (MoECRT, 2020).

When teaching literacy, the formulation and creation of PISA-model questions play an essential role (Zulkardi, 2010). The PISA-model questions employed in the teaching and learning process should use context because one of the hallmarks of PISA questions is that they are context-based (OECD, 2018). For this reason, teachers need to construct problems by making use of the environment their students are a part of in a manner that is relevant to the students' everyday lives (Puspitasari et al, 2021; Zulkardi & Putri, 2006). Since health issues have become so ubiquitous in Indonesia over the past few years, students of Bahasa Indonesia must discuss them in context while they study. When students become aware of the significance of taking care of their health, it piques their curiosity and makes them want to study more about the topic. Therefore, this health-related context can help with students' literacy development by making it easier for them to digest information that broadens their awareness of what can and cannot be done. This broadens the reader's comprehension of what options are available to them.

Several previous studies on the development of reading literacy questions, such as PISA ones, using local (Pratiwi, 2021), national (Alwi et al., 2021), and international (Puspita et al., 2021) contexts have produced promising results. However, this study employed a more specific context, health. In order for students to adapt to change, a variety of novel health-related situations were presented. Therefore, news articles entitled "Eggs and Health" and "Bathing the Baby" were used. This is essential information for everyone, particularly students, in order to maintain proper nutrition and personal hygiene.

This research was also conducted to encourage students to study and enhance their reading literacy skills if they have low reading levels (Gebremariam & Gedamu, 2022). The items were developed with a focus on efforts to increase literacy through reasoning and reading activities, where students are supposed to provide arguments for their answers to the questions.

Previous research has examined the significance of worksheets that were developed based on the PISA 2018 framework for enhancing reading literacy competence among junior high school students (Khamkhong, 2018; Iskandar et al., 2022; Koyuncu & Firat, 2021). To date, however, no research has analyzed scenarios utilizing the most recent framework,

PISA 2022, to enhance students' reading literacy abilities.

The significant contribution in the forms of questions can be used by teachers and students as teaching and learning materials to prepare students for the MCA based on the PISA 2022 framework with a specific context, health, and a focus on efforts to have students use reason in their thinking processes. In order to improve students' reading literacy, this study aims to design valid, practical, and efficient reading comprehension questions, comparable to the PISA, in the health context.

## 2. Literature Review

### 2.1 The PISA 2022 Framework

The PISA's seventh edition assesses people's knowledge and skills. The PISA itself evaluates 15-year-olds nearing the conclusion of compulsory education on knowledge and abilities for full participation in modern society. The triennial test stresses reading, math, and science as core subjects. In 2022, students were tested on global competency, an innovative domain. The examination assesses students' ability to apply what they have learned in novel circumstances, both within and outside the classroom. Modern economies reward what people can *do* with their knowledge, not what they *know*.

According to Rojas-Torres et al. (2021), various nations and economies have distributed a questionnaire to teachers to gather information on their training and professional development, teaching practices, and work satisfaction. In several countries/economies, parents were given an optional questionnaire regarding their views of and involvement with their child's schooling, their support for the child's learning at home, and the child's reading and cultural engagement.

The PISA is distinguished by (1) its policy orientation, which links data on student learning outcomes with data on student backgrounds, attitudes toward learning, and critical factors that shape their learning outside of school (this exposes differences in performance and identifies the characteristics of successful students, schools, and education systems), (2) its large sample size and use of a standardized assessment instrument, (3) its novel concept of "literacy," which refers to students' capacity to apply knowledge and skills to analyze, reason, and communicate effectively as they identify, comprehend, and solve problems in various contexts, (4) relevance to lifelong learning, as the PISA asks students to reflect on their motivation to study, self-beliefs, and learning practices, and (5) regularity, which allows governments to track their progress toward essential learning objective breadth of coverage (in PISA 2018, it included all 37 OECD nations and 42 partner nations and economies) (OECD, 2018).

## 2.2 Reading Literacy

The PISA 2018 was focused on the reading domain. Reading literacy is the ability to comprehend, apply, analyze, reflect on, and engage with texts to achieve one's goals, develop one's knowledge and potential, and allow one to participate in society (Alwi et al., 2021). The PISA uses multiple-process questions to assess students' proficiency in reading. Since most 15-year-olds have basic reading abilities, they are not subjected to tests on these basic reading abilities. Students are expected to demonstrate their reading literacy skills by the following: finding information, which includes both accessing and retrieving information from text and searching for and selecting relevant text; understanding text, which includes both acquiring a representation of the literal meaning of the text and building an integrated representation of it; and evaluating and reflecting on text, which includes both judging the text's quality and credibility and reflecting on it.

The material's intended application determines PISA reading comprehension. Novels, letters, and biographies are personal. Documents and announcements are for public consumption. Professionals use reports and guides. Textbooks and worksheets are for teaching. The test includes several reading environments since some students perform better in certain ones. The PISA text format includes mono- and multi-source texts, static and dynamic texts, continuous texts (sentences and paragraphs), non-continuous texts (lists, forms, graphs, and diagrams), and mixed texts. The PISA 2022 reading framework incorporates new methods of reading established since 2009. Digital reading and growing printed and digital content are some examples (OECD, 2022).

## 2.3 Contextual Learning

Contextual literacy instruction is beneficial. The contextual approach, also known as contextual teaching and learning (CTL), incorporates the material studied into students' daily life. Contextual learning's seven main components, including asking, finding, and reflecting, support critical thinking (Johnson, 2010). Johnson claims that CTL promotes critical thinking. Muslich (2007) recognized the need for contextual learning because most students cannot relate what they learn to actual life. According to the Ministry of National Education (2007) and Jubhari et al. (2022), contextual learning is an educational process that helps students understand the meaning of the subject matter they are studying by relating it to their daily lives (personal, social, and cultural contexts) so they can learn skills that can be applied to other problems/context.

The situation used in this research is the health context. The context of health becomes a prominent theme in the texts. The texts are entitled "Eggs and Health" and "Bathing the Baby". The text entitled

"Eggs and Health" was chosen keeping in mind the importance of protein for the body in dealing with the COVID-19 pandemic. In addition, the text entitled "Bathing the Baby" was chosen considering the importance of bathing a baby in terms of health.

## 3. Method

### 3.1 Research Type

This design research comprises a preliminary and a formative evaluation phase (Bakker, 2018; Zulkardi, 2006). There were several activities included in the preliminary stage. The PISA framework was evaluated using PISA questions from PISA 2000 to 2018, and the PISA 2022 research criteria consisting of content, context, and cognitive intelligence at the level of reasoning were established. The researchers then analyzed the independent learning curriculum adapted to the PISA 2022 framework. The findings from this analysis were then used to draft activity questions and evaluation questions, as well as supplementary instruments, such as question grids, question cards, assessment rubrics, interview question lists, and a validation sheet.

The formative evaluation process carried out included the stages of expert review, 1-1 activity, small-group test, and field test. Lecturers of the Indonesian Language Education Department of Universitas Sriwijaya and a junior high school Bahasa Indonesia teacher validated the research instruments during the expert review phase. In addition, the researcher conducted 1-1 validation with three students of low, medium, and high levels of abilities who were not included in the research population. Before proceeding to the small-group test stage, the criticisms and suggestions from the expert review and 1-1 validation stages were adopted for revisions. The small-group test stage involved nine students with low, medium, and high abilities in small groups to evaluate the practicality of the questions generated. Each student responded individually in a small group, and each student group was assigned an observational research team. The groups ultimately answered the questions, allowing the students to demonstrate their efforts. Concurrently, the model teacher interviewed the students to assess their comprehension of the activity and evaluation questions. During the phase of small-group testing, enhancements were made before the field testing was commenced.

The subsequent phase was a field test, in which 33 students from SMPN 59 Palembang participated. This school was chosen because it served as a PISA pilot school. In addition, the selected students were recommended by the teacher based on their cognitive abilities and age (below 15 years) as judged from daily class assessments. Students with high, medium, and low abilities participated in the field test. The researcher cooperated with an exceptional educator to administer the advanced field testing.

In this research, as learning material for the first meeting's field test, PISA-like questions and activities were offered. One class was given evaluation questions during the second meeting of the field test. At this level, trials on this research were conducted utilizing valid and practical PISA-like questions and activities. The objective of the field test was to analyze the questions' potential effect by analyzing students' responses using markers of their literacy skills.

### 3.2 Research Subjects

This research evaluated formatively the abilities of 45 (15-year-old) students with varied levels of abilities (high, medium, and low). Purposive sampling was used to select the research participants. Age, the diversity of students' abilities, as well as teacher and school recommendations were used as indicators in selecting the subjects. Of the 45 students who participated, three participated in the 1-1 activity, nine participated in the small-group test, and 33 participated in the field test. According to the subjects included in the triennial PISA assessment, the average age of the participating students is (under) 15 years (OECD, 2018). The varying of student abilities was based on the daily assessment documents generated by the teacher. This was intended to obtain questions based on learning diversity applicable to the real world (Saleh et al., 2021).

### 3.3 Data Collection and Data Analysis

The researcher gathered data through document reviews, observations, tests, and interviews. Document reviews were carried out at the preliminary phase to obtain data through an analysis of the PISA 2022 framework and the independent learning curriculum. Document reviews were also conducted during the formative evaluation phase to review FGD (expert review) and 1-1 activity data in the forms of comments and suggestions. During small-group and field tests, observations were made with the intent of identifying students' difficulties in comprehending the questions in terms of content, structure, and language. During the 1-1 activity, small-group test, and field test, interviews were conducted to clarify the answers provided by students on their answer sheets. The field test was administered to determine the effectiveness of the PISA-like reading literacy questions that were produced. The collected data were later analyzed and qualitatively described.

## 4. Results

There were five activity units and seven evaluation units in this research. The use of the health context was expected to aid students in answering questions effectively. However, the research focused on one unit with two PISA-like questions with news item titles "Eggs and Health" and "Bathing the Baby."

### 4.1 Preliminary Stage

During the preliminary phase, the researcher observed several junior high schools in Palembang to identify and determine the research subjects, time, and flow of learning activities. The researcher then picked several recent PISA questions as references for developing PISA-like reading literacy questions in the health context.

The researcher then visited SMPN 59 Palembang to determine the students who would participate in data collection during the 1-1 activity and small-group testing according to the Bahasa Indonesia teacher's selection. For the 1-1 activity, the researcher identified three students with varying competency levels: high, medium, and low. Meanwhile, nine students with high, medium, and low skills were selected and placed into three study groups for small-group testing. This grouping was aimed so that students could discuss the questions that they received. In addition, the researcher noted students' difficulties in answering the questions. At this point, there were variances in the cognitive processes of students with different abilities when answering questions.

The next step in the research process was to identify the instructional materials used by teachers at SMPN 59 Palembang according to the applicable curriculum. The curriculum used in this school was the revised Curriculum 2013. The topic of the news items is included in the first chapter of the revised Curriculum 2013 for the Bahasa Indonesia subject. The researchers examined the instructional materials used by the teachers to teach about news items. In addition, the researcher evaluated PISA questions from recent years and discovered news item questions with related content. Figure 1 describes one of the PISA questions that were to be used as a reference in 2022 to build the research's questions.



## COKELAT DAN KESEHATAN



Khasiat epicatechin dalam kesehatan, suatu zat yang ditemukan pada buah kakao, sangat besar yang dapat melindungi khasiat penisilin, menurut sebuah laporan yang diterbitkan oleh Chemistry & Industry. Profesor Norman Hollenberg dari Harvard Medical School menghabiskan waktu bertahun-tahun untuk meneliti suku Kuna di Panama, peminum kakao, dan menemukan bahwa risiko mereka terkena serangan otak, gagal jantung, kanker, dan diabetes lebih kecil dari 10 persen. "Epicatechin sangat penting untuk

**Artikel mengenai "Cokelat dan Kesehatan" di atas diterbitkan tahun 2007.**

**Perhatikan artikel "Cokelat dan Kesehatan". Tulislah jawabanmu untuk menjawab pertanyaan berikut.**

Walaupun epicatechin ada di dalam cokelat, yang berasal dari buah kakao, bacaan tidak menyinggung cokelat. Menurut kamu mengapa penulis memilih gambar dan judul yang menampilkan cokelat?

**Figure 1.** An Original PISA 2022 Question with a Chocolate and Health Context

Figure 1 presents a PISA 2022 question containing a news item. The context is chocolate and health. This text discusses the importance of epicatechin in human health based on research conducted at Harvard Medical School. The article focuses on the health benefits of the chemical compound epicatechin, but neither chocolate nor cocoa is mentioned. The question asked is why the author included an image of chocolate bars while the text does not cover chocolate. This question uses a cognitive process in the form of evaluation (quality and

credibility) based on the PISA framework to assist students in evaluating the material included in the text with predictions at question level 6. Responding to this question requires the application of critical thought. According to Dizier and Moens (2011), students may overcome difficulties and answer questions practically using reason. Consequently, this research aims to improve reading literacy in a manner comparable to the PISA using a health context and a process based on reasoning and critical thinking.


## 4.2 Self-evaluation

In the self-evaluation phase, the researcher examined and evaluated PISA-like reading literacy questions in the health context. According to Saputri et al. (2020), when generating questions, content, construct, and language should be evaluated and reviewed. If there were problems such as misspellings,

incorrect word selection, or incomplete sentences, the researcher would correct the questions and texts concerned. Students were given a test with both the texts and questions by the researcher. As illustrated in Figure 2, the researcher created prototype 1 by modifying the PISA-like questions based on the self-evaluation findings.

### UNIT 1: Eggs and Health

**Eggs and Health**



One of the functions of protein is to produce enzymes and hormones that can maintain the function of cells and organs of the body. In addition, protein has the primary function as a substance to repair cell tissue to work optimally. Protein is a nutrient found throughout the body, including bones, skin, muscles, and hair. Protein consists of building blocks known as amino acids. There are approximately 20 types of amino acids, nine including essential amino acids and the remaining 11 including non-essential amino acids. The body can produce amino acids without food intake. However, the amino acids produced by the body are non-essential amino acids. Therefore, to get essential amino acids, we must consume certain foods.

We often hear that foods containing protein have many benefits for the body. Aside from being a nutrient, protein also has a variety of other functions that are important to the body. Several proteins are also known to build cells and tissues to make them strong. Protein plays a role in the body's structure through keratin, collagen, and elastin. These proteins can form a particular structural framework so that they are interrelated. Keratin is found in the skin, hair, and nails. At the same time, the protein collagen is found in the body and supports the health of the structure of bones, tendons, ligaments, and skin. The protein elastin can be found in the uterus, lungs, and blood vessels.

**Pay attention to the article "Protein and Health." Write your answer to answer the following questions.**

1. In your opinion, why did the writer choose a picture featuring bodybuilders?

### UNIT 2: Bathing the Baby

**Bathing the Baby**

Bathing a baby is exciting and stressful, especially if your little one is the first child. This moment can also build and strengthen the bond between mother and baby through touch, gaze, and sound. Apart from that, bathing is also necessary so that the baby's cleanliness is maintained and he is not susceptible to infection, especially skin infections, considering the condition of his skin which is still sensitive.

**Pay attention to the article "Bathing the Baby." Write your answer to answer the following questions.**

2. If a mother rarely bathes her child. Is there no bonding between baby and mother?

Figure 2. Prototype 1 of PISA-Like Reading Questions Using Health Context (Before Revision)

Figure 2 depicts prototype 1 of PISA-like reading literacy questions about news item content. As shown in Figure 2, the researcher included an image pertinent to the text's subject matter to facilitate students' ability to visualize its meaning. The original text was rather lengthy. Therefore, the researcher reduced it by extracting lines containing the reading's most crucial information. This is aligned with the statements of Pranowo (2011) and Marpaung et al. (2016) that students will quickly comprehend a reading material if it has relatively few phrases.

The initial question posed for the second text was "Does washing a newborn affect bonding?", but the researcher assumed that the question was a closed one, which would not assess students' critical thinking abilities. Therefore, the researcher altered it with an added level of difficulty for students. As explained by Amir (2014), students' problem-solving reasoning skills can be developed through open-ended questions. Prototype 1, which featured self-evaluation phase enhancements, advanced to the expert review and 1-1 activity stages.

### 4.3 Expert Review and 1-1 Activity

The PISA-like reading literacy questions (as depicted in Figure 2) were refined using an FGD and 1-1 activity. A combination of online platforms such as WAG and Zoom facilitated this formative procedure. Several inputs and ideas (see Table 1) were identified during the FGD and 1-1 activity processes. During the development process, it was determined that the PISA-like reading literacy questions needed to be improved to include more comprehensive and easier-to-read images, additional data sources, concise explanations, and less ambiguity.

The previously built PISA-like reading literacy questions were changed considering the FGD and 1-1 activity comments and ideas. Theoretically, a sequence of actions produced valid PISA-like reading literacy questions in terms of content, construct, and language.

**Table 1.** Inputs and Suggestions from the FGD and 1-1 Activity on the PISA-like Reading Literacy Questions

Validators	Comments and Suggestions	Revision Decisions
<b>Eggs and Health Context</b>		
<b>FGD</b> <b>(Lecturers, a teacher)</b>	<ul style="list-style-type: none"> <li>• Provide representative photographs to enhance visual comprehension.</li> </ul>	<ul style="list-style-type: none"> <li>• The researcher provided representative photographs to enhance visual comprehension.</li> </ul>
<b>1-1 Activity</b> <b>(Students)</b>	<ul style="list-style-type: none"> <li>• The layout lacks color, which makes it less appealing.</li> <li>• The question difficulty must be diverse and well-balanced.</li> <li>• Provide text analysis expertise in the cover letter.</li> <li>• Provide a justification to the question.</li> <li>• Provide supporting details before the primary query.</li> </ul>	<ul style="list-style-type: none"> <li>• The researcher made some aesthetic improvements to the design by adding boxes and colors.</li> <li>• The difficulty level of the question used was varied and well-balanced.</li> <li>• The researcher provided text analysis expertise in the cover letter.</li> <li>• The researcher provided a justification to the question.</li> <li>• The researcher provided supporting details before the primary query.</li> </ul>

After receiving comments and suggestions during the expert review and 1-1 activity phases, the researcher revised the layout of the section titled "Eggs and Health". The researchers added captivating images and coloring. In addition, the researcher improved the content, particularly in terms of the form of the question, the difficulty level of the question, and the language used in the question.





Validators	Comments and Suggestions	Revision Decisions
<b>Bathing the Baby</b>		
<b>FGD</b> <b>(Lecturers, a teacher)</b>	<ul style="list-style-type: none"> <li>• Provide an illustrative image to improve visual comprehension.</li> <li>• The lack of color makes the design less appealing.</li> <li>• The terminology employed in the question is appropriate. It only needs minor modifications in a few areas.</li> </ul>	<ul style="list-style-type: none"> <li>• The researcher included an image to aid student comprehension.</li> <li>• The researcher added color to the question design to make it more engaging.</li> <li>• The researcher addressed several writing errors and identified other improvement opportunities.</li> </ul>
<b>1-1 Activity</b> <b>(Students)</b>	<ul style="list-style-type: none"> <li>• Please pay close attention to the color selection to add visual appeal.</li> <li>• Correct several errors in spelling, prepositions, and punctuations based on the validators' comments</li> </ul>	<ul style="list-style-type: none"> <li>• Color selection was made to reflect the preferences of the students.</li> <li>• Researchers have corrected several misspellings.</li> </ul>

After receiving comments and suggestions from the expert review and 1-1 activity stages, the design and coloring of the item entitled "Bathing the Baby" were revised. The problem would be more easily comprehensible to students if the researcher provided a relevant illustration and coloring. In addition, the majority of the issues that occurred were related to language, where there were a number of errors in spelling, prepositions, and punctuations, and some of the diction was hardly recognizable.

#### 4.4 Small-Group Test

##### UNIT 1

**Eggs and Health**  
**(Introduction)**

One of the functions of protein is to produce enzymes and hormones that can maintain the function of cells and organs of the body. In addition, protein has the primary role as a substance to repair cell tissue to work optimally. Protein is a nutrient found throughout the body, including bones, skin, muscles and hair. Protein consists of building blocks known as amino acids. There are approximately 20 types of amino acids, 9 including essential amino acids and the remaining 11 including non-essential amino acids. The body can produce amino acids without food intake. However, the amino acids produced by the body are non-essential amino acids. Therefore, to get essential amino acids, we must consume certain foods.

We often hear that foods containing protein have many benefits for the body. Aside from being a nutrient, protein also has a variety of other functions that are important to the body. Several proteins are also known to build cells and tissues to make them strong. Protein plays a role in the body's structure through keratin, collagen, and elastin. These proteins can form a specific structural framework so that they are interrelated. Keratin is found in skin, hair and nails. At the same time, the protein collagen is located in the body and supports the health of the structure of bones, tendons, ligaments and skin. The protein elastin can be found in the uterus, lungs and



Eggs and Health  
(Questions 1/4)


The article on "Protein and Health" above was published in 2021. Pay attention to the article "Protein and Health" and write down your answer to answer the following questions!

Although the protein in eggs is highest in egg whites, the reading above does not offend bodybuilders. Why do you think the author chose an image featuring a bodybuilder?

**Figure 3a. Eggs and Health Context (After revision)**

## UNIT 2

Bathing the Baby  
(Introduction)



Bathing a baby is exciting and stressful, especially if your little one is the first child. This moment can also build and strengthen the bond between mother and baby through touch, gaze and sound. Apart from that, bathing is also necessary so that the baby's cleanliness is maintained and he is not susceptible to infection, especially skin infections, considering the condition of his skin which is still sensitive.

Bathing the Baby  
(Questions 2/4)

**Pay attention to the article "Bathing the Baby" and write down your answer to answer the following questions!**

**In your opinion, if a mother rarely bathes her child. Is there no bonding between the baby and the mother?**

**Figure 3b. Bathing the Baby Context (After revision)**

The PISA-like reading literacy questions on prototype 1 (shown in Figure 3) were given to three small groups of three students with varying skills. Students collaborated for ten minutes to solve problems. During the learning activity with small groups of students, the researcher adopted the problem-based learning model that includes steps such as orienting

students to problems, organizing students to study, directing individual/group investigations, having students to produce and present work, and assessing and evaluating problem-solving processes (Allen & Bernhardt, 2011).

The findings from the small-group activity suggested that the students comprehended the test problems given that various solutions were presented. Nonetheless, the instruction should show some key points. In the meantime, other data from students' process of solving the problems revealed tremendous difficulties that the students were facing in comprehending meanings. Therefore, the researcher revised a few sentences to make them easier to

comprehend. In addition, the PISA-like reading literacy questions developed were considered practical. According to Zulkardi (2002) and Nieveen (2007), this finding is significant. They validated that a PISA question is practical when it satisfies a number of criteria, such as expert opinions about usable items, considerable development, and the capability of students to solve and comprehend issues using a range of different lines of reasoning.

**Eggs and Health**  
**(Questions 1/4)**

**Pay attention to the article "Eggs and Health" and write down your answer to answer the following questions!**

This text is about eggs and health but nothing about bodybuilders. Why do you think the author provided pictures of bodybuilders? Explain the relationship between the text and the image!

**Figure 4a.** Prototype 3 of the PISA-like Reading Literacy Question with the Eggs and Health Context.

**Bathing the Baby**  
**(Questions 2/4)**

**Pay attention to the article "Bathing the Baby" and write down your answer to answer the following questions!**

Based on the text, bathing the baby will bond between mother and baby. Please use your logic. Is it when mothers often bathe their babies? Does not bonding develop between the two, and explain why?

**Figure 4b.** Prototype 3 of the PISA-like Reading Literacy Question with the Bathing the Baby Context.

Figures 4a and 4b show the improved questions based on the results of observation of the small-group activity. As shown in Figure 4a, the researcher improved the sentences of the instruction and question. In prototype two, the instruction for the item with the Eggs and Health context read "The article on 'Protein and Health' above was published in 2021. Pay attention to the article 'Protein and Health' and write down your answer to answer the following questions!". The researcher deleted the first sentence of the instruction to avoid confusion among students. There was no relevance between the question and the instruction sentences. In addition, the phrase "Protein and Health" was changed to "Eggs and Health" according to the title of the text. Furthermore, the first question, which read "Although the protein in eggs is high in egg whites, the

reading above does not offend bodybuilders. Why do you think the author chose an image featuring a bodybuilder?", was changed into "This text is about eggs and health but nothing about bodybuilders. Why do you think the author provided pictures of bodybuilders? Explain the relationship between the text and the image!". This change was made on the assumption that the students' ability to understand complex questions would be hampered by ineffective sentence structures.

On the other hand, as shown in Figure 4b, the researcher made improvements to the question sentence that read, "In your opinion, if a mother rarely bathes her child. Is there no bonding between the baby and the mother?" into "Based on the text, bathing the baby will bond between mother and baby. Please use your logic.

Is it when mothers often bathe their babies? Does not bonding develop between the two, and explain why?". This change was made on the assumption that students would understand better if more words were added to clarify the meaning of the problem. This is in line with Laily's (2014) opinion that the use of simple and straightforward sentences in questions will affect students' ability to understand the questions and how to answer them.

#### 4.5 Field Test

The reading literacy skills that emerged during the field test activity were locating information by accessing and retrieving information within a text, as well as searching and selecting a relevant text (L1), understanding by representing literal meaning, as well as integrating and generating inferences (L2), and evaluating and reflecting by assessing quality and credibility, reflecting on content and form, and detecting and handling conflicts (L3). These reading literacy skills could be seen in how students were reasoning for solving problems. The results showed that the students' reading literacy skills emerged when they were working on the questions.

<p>1. Karena binaragawan Mengonsumsi Protein dan telur Salah Sabaya.</p>	<p>The student's answer is correct with the right reason</p>
<p>Translated into English:</p> <p>Because bodybuilders consume protein, one of which is eggs</p> <p>(a)</p>	
<p>1. Karena, seorang binaragawan membutuhkan banyak Protein untuk membentuk tubuh yg Peauh otot</p>	<p>The student's answer is correct with the right reasons</p>
<p>Translated into English:</p> <p>Because bodybuilders need much of protein to build a muscle body</p> <p>(b)</p>	
<p>1. Karena Telur Menghasilkan Protein</p>	<p>The student's answer is wrong</p>
<p>Translated into English:</p> <p>Because eggs produce protein</p> <p>(c)</p>	

Figure 5. Students' Solutions to the PISA-like Reading Literacy Question with a Health Context



Figure 5 shows some students' field test answers. The responses indicate that the students could use their reading literacy skills to solve the prepared questions. As shown in figure 5a, the student's answer was correct and supported by a correct explanation. The student reasoned that bodybuilders take various nutrients, including the protein in eggs. This shows that the student was at L3, which describes the cognitive process completed by the student (i.e., evaluating by assessing quality and credibility). The student could answer the question using a variety of cognitive processes, including accessing the information contained in the text through a comprehensive reading process (L1), understanding the reading by comprehending the literal meaning of the sentences in the task (L2), and answering logically and critically through the evaluation process by identifying information in the text and considering answers from a variety of perspectives. The capacity to combine information from the text being read with information from outside the text, such as information from experience, logic, and reasoning, can assist students in achieving reading literacy skills by evaluating quality and credibility. On this, Winarti (2016) stated that students' problem-solving abilities may be demonstrated in the use of reasoning and logical thinking acquired through PISA-like question-based learning.

Unlike in Figure 5a, the answer shown in Figure 5b was correct, but the explanation provided was different. The student answered by referring to the function of protein derived from eggs that bodybuilders need in building a muscular body. The student answered correctly and provided a logical reason from a different perspective, namely, the function of the object discussed in the task. The use of perspective variations can help students solve problems in questions. This is in line with McKie et al.'s (2012) observation on children that students' reading literacy skills can be seen in their use of various strategies to solve problems.

On the other hand, the answer shown in Figure 5c was similar to the answer in Figure 5a, but it did not explicitly explain the relationship between the bodybuilder illustration and the text. Therefore, the answer in Figure 5c was considered wrong. The cognitive process shown in Figure 5c did not go beyond L2, namely understanding the literal meaning

in the text without using logical thinking and reasoning. In addition, the student answered with a less informative and specific sentence. The student was supposed to use specific language in solving problems so as not to cause misunderstandings. As stated by Kurniawan (2018), a textual explanation of a set of interaction scenarios can help people understand the meaning in the interaction context. Many misunderstandings that arise are caused by people needing more sentence specifications when interacting. Based on the analysis of the answers in Figures 5a, 5b, and 5c, students' ability in reading literacy can be seen from their logical thinking in relation to the problem in the question (Segers et al., 2016). This is supported by the ability to explain answers properly and specifically and follow the context in question. Sentences and explanations are, in the words of McNamara (2004), clear and comprehensive indicators in assessing students' reading literacy skills.

To answer this question, it is necessary to use logical thinking from various points of view. In terms of content, construct, and language, the question was considered good because students could understand it. In other words, according to Zulkardi (2002) and Nieveen (2007), the question is said to be effective. They stated that PISA items become effective when they meet several criteria, including expert statements on usable item development and significant student ability to solve and interpret items using various strategies. The researcher confirmed this by interviewing the students. The results of student interviews performed during the field test are provided below.

Transcript 1 shows that S1 and S2 were able to answer the question correctly. As shown by the interview results, they could understand the intent of the question well. On the other hand, S3 had a hard time answering the question due to concentration difficulties in understanding the problem. PISA questions require an excellent reasoning process. Students must use critical thinking skills to solve problems. Therefore, when dealing with PISA-like reading literacy questions, students must read the questions comprehensively. As explained by Namaziandost et al. (2022), the impact of comprehensive reading can build reading skills for learners.

### Transcript 1

- |    |  |
|----|--|
| R  | : In your opinion, why did the writer choose a picture featuring a bodybuilder?  |
| S1 | : Because bodybuilders consume protein, one of which is eggs.  |
| S2 | : Bodybuilders need much protein to build muscle. So, this picture shows that bodybuilders can have a muscular body due to frequent consumption of eggs. |
| S3 | : I think it is because bodybuilders often eat eggs that they have a good body.  |
| R  | : To S3, why did you answer that eggs produce protein?   |

- S3 : Oh, sorry, I misunderstood the question.
- R : What made you misunderstand the question? Are there words that are difficult to understand?
- S3 : There is no editorial problem. I was just not concentrating because I was tired.
- R : Well, what is the relationship between health and the bodybuilder?
- S1 : A bodybuilder has a muscular body, so a bodybuilder's image represents a healthy body.
- S2 : Bodybuilders often exercise and eat eggs, so that their bodies are muscular and their health is maintained.
- S3 : Yes, most bodybuilders have healthy bodies because they often exercise and consume protein.

Note: R: Researcher; S1: Student DR; S2: Student ADS; S3: Student SA

<p>2. Tidak Seperti itu, Ada Moment/Kedua yg dapat Membikin bonding (Ikatan) Selain Saat Mandi.</p> <p><b>Translated into English:</b></p> <p>Not. There are other moments or situations that can bonding besides bathing the baby.</p> <p>(a)</p>	<p>The student's answer is correct with the right reason</p> <p>L3 (Evaluating by assessing quality and credibility)</p>
<p>2. Iya, karena Salah Satu Cara Untuk Membangun bonding antara ibu dan bayi adalah dengan memandikannya.</p> <p><b>Translated into English:</b></p> <p>Yes. one way to build bonding between mother and baby is bathing the baby.</p> <p>(b)</p>	<p>The student's answer is wrong</p> <p>L1 (Locating information by accessing and retrieving)</p>
<p>2. Jarang, karena Kita harus membangun bayi secara teratur untuk membangun bonding dengan si kecil.</p> <p><b>Translated into English:</b></p> <p>Rarely because we have to bathe the baby regularly to build bonding with the baby.</p> <p>(c)</p>	<p>The student's answer is wrong</p> <p>L2 (Understanding by representing literal meaning),</p>

Figure 6. Students' Solutions on the PISA-like Reading Literacy Question in a Health Context

Figure 6 describes the students' field test answers. The answers show that the students could use reading literacy skills to solve the problem in the question developed. As shown in Figure 6a, the student's answer was correct, and so was the reason. The student

answered that bonding does not only occur when the mother bathes the baby. Many other activities can build bonding between the mother and the baby. The cognitive process achieved by students was L3 (evaluating by assessing quality and credibility).

The student could answer the question through several cognitive processes, namely, accessing the information contained in the text through a comprehensive reading process (L1) and understanding the literal meanings of the sentences in the reading (L2). The student was able to provide a logical reason critically through the evaluation process by identifying information in the text and considering answers using different points of view. Integrating information in the text read with information outside the text, for example, information from experience, logic, and reasoning, helps students achieve reading literacy skills in evaluating by assessing quality and credibility. This is in line with [Stedler et al.'s \(2020\)](#) explanation that questions combining problem-solving through reasoning are valid in increasing the ability to solve PISA-like questions.

In contrast to the answer in [Figure 6a](#), the answer in [Figure 6b](#) was incorrect, and the reason needed correction. The student tended to answer the question only based on the text read. The cognitive process that took place was only L1 (locating information by accessing and retrieving information within a text). In other words, the student only answered the question based on the information read in the text without using reasoning and logical thinking. Therefore, the student could not solve the problem in the question well because they did not refer to other sources from other perspectives, such as experience or other reading sources. Students should answer questions based on the information in the questions and combine it with additional information.

The same thing happened to the answer in [Figure 6c](#). The student did not answer the question correctly because they thought that when the mother does not bathe the baby, bonding will hardly occur between herself and the baby. The student only went through the cognitive processes of L1 (locating information by accessing and retrieving information within a text) and L2 (understanding the literal meaning in the text without using logical thinking and reasoning). The student also showed doubts in answering the question. This is evident from the word "rarely", indicating that the student was hesitant in choosing between "yes" and "no". Thus, the student's ability to think critically in this learning process was considered nonexistent because they did not dare to give a firm statement. In fact, the ability of students to provide personal opinions accompanied by facts can encourage the students' reading literacy skills. Therefore, based on the analysis of answers in [Figures 6a, 6b, and 6c](#), students' ability in reading literacy can be seen from logical thinking about the problems in the questions ([Segers et al., 2016](#)).

To answer this question, it is necessary to use logical thinking using various points of view. In terms of content, construct, and language, the question is good because they could be understood by students. In other words, the question is said to be practical and effective, in line with [Zulkardi's \(2002\)](#) and [Nieveen's \(2007\)](#) opinion that PISA items become practical and effective when they meet several criteria, including expert statements on usable item development and significant student ability to solve and interpret items using various strategies.

### Transcript 2

- R : After reading the text, can we conclude that if the mother rarely bathes the baby, there will be no bonding between the mother and the baby?
- S1 : No, many other activities can build bonding. Bathing a baby is one way to build bonding, so it is not the only way to build bonding.
- S2 : Yes, because bathing a baby is one way to build bonding between mothers and babies.
- R : If you said one way, why did you answer, "Yes, there will be no bonding."
- S2 : Yes, I answered incorrectly and needed to think logically.
- R : How about you, S3?
- S3 : I doubt my answer.
- R : What made you hesitate?
- S3 : I did not dare to say yes or no, so I was unsure about my answer. I had to choose clearly and definitely. I did not think it has a connection because bathing the baby will build bonding with the baby.

Note: R: Researcher; S1: Student DR; S2: Student ADS; S3: Student SA



Transcript 2 shows that S1 is more likely to overcome challenges using reasoning and logic when trying to understand events. This makes it more likely that S1 will find answers to problems. S1 could answer the questions asked by connecting various other scenarios not contained in the text. Meanwhile, S2 and S3 did not apply reasoning or logical thinking when faced with situations not covered in the text. To complete PISA-like reading literacy questions, students need reasoning skills to achieve comprehensive reading skills. This is in line with [LaRusso et al. \(2016\)](#), who stated that comprehensive reading skills emerge when people deepen complex reasoning.

## 5. Discussion

The capacity of students to solve problems through reading and reasoning is crucial because it teaches them to think critically in accordance with the demands of the twenty-first century ([Hesse et al., 2015](#); [Gravemeijer et al., 2017](#)). This can be accomplished if students in Indonesia are accustomed to answering queries at a high level and can provide explanations or justifications for their responses ([McKie et al., 2012](#); [Ali, 2022](#)). It is hoped that this will assist Indonesian students catch up with the PISA ([OECD, 2018](#); [2019b](#)). Therefore, teachers must have access to PISA-compliant instructional materials that include additional context-based elements, such as the health context.

PISA-like reading literacy questions' incorporation of a health context can, in general, stimulate students to study and think critically, as well as engage students' reasoning and logical thinking skills in the process of learning. This can be beneficial. This demonstrates that a higher plane of thinking is necessary in higher-order thinking skills (HOTS). According to [Alwi et al. \(2021\)](#) and [Hewi & Shaleh \(2020\)](#), the utilization of context encourages students to study and build their reading literacy skills since it is relevant to their day-to-day lives ([Utami, 2019](#); [Sen & Oztekin, 2019](#); [Harahap, 2020](#); [Vladimir, 2020](#)). This is in accordance with the previous statement. In addition, the utilization of context will motivate students to participate in learning activities that include collaboration, which will ultimately lead to more meaningful learning ([Putri & Zulkardi, 2020](#); [Angga et al., 2022](#)).

### 5.1 Prototyping Phase

These PISA-like reading literacy questions can assist students in mastering PISA-like questions. The development of these questions is predicted to improve students' literacy skills because they train students' reasoning and critical thinking ability to comprehend difficult material. The designed questions are effective because they do not contain double meanings, the graphics exhibited are clear, and the questions incorporate situations that are relevant to students' everyday lives. It is anticipated that using this

background will make it easier for students to answer challenges. In accordance with [Nusantara & Putri, \(2021\)](#), teachers should design problems by utilizing the environment their students inhabit in a way that is relevant to students' everyday lives, as this assists students in solving problems.

When students are given PISA-like reading literacy questions using the health context, which has an aesthetically pleasing arrangement, as shown in Figure 3, they are motivated to solve the questions because it is easier for them to read the questions, which enables them to identify the information that is available in a careful manner. Additionally, the question and situation formats are congruent with contexts they will encounter in the actual world they will be exposed to. As a result, emerging literacy can be understood as integrating specific information and beginning knowledge that students can utilize to find solutions to challenges. Students who have developed reasoning skills have a better chance of combining the stages of the learning process to correctly perceive, formulate, and solve problems ([Alwi, 2021](#)). In addition, it is essential to have an early understanding of the difficulties that exist in the actual world in order to solve and comprehend PISA challenges ([Puspitasari et al., 2021](#); [De Bortoli, 2021](#); [Sempe, 2021](#); [Sofa et al., 2020](#)).

The content, construct, and language validity of the PISA-like reading literacy questions with the health context produced theoretically and practically by the researcher has been determined. After the stages of expert review and 1-1 activity, in which the experts made multiple comments and generated a number of ideas, the researchers determined the validity of the product created in this research. After receiving the suggestions and comments, the researcher made an update to create prototype 2. According to [Zulkardi \(2002\)](#), the initial prototype is declared qualitatively valid based on the comments and suggestions of experts, as well as on student's understanding of the issues.

### 5.2 Learning Process Using PISA-Like Reading Literacy Questions

Based on the results of this research, applying the problem-based learning (PBL) model to the construction of PISA-like reading literacy questions significantly impacts on the development of students' reading literacy skills. The PBL model consists of five phases: student orientation to problems, student organization for learning, students conducting individual/group investigations, students generating and presenting work, and evaluating the problem-solving process ([Dazhi Yang et al., 2021](#); [Bahri & Corebima, 2019](#); [Chang et al., 2020](#)). Regarding the phase of student introduction to problems, students can easily comprehend the information in the text they read although the text is excessively lengthy and contains sentences that they seldom encounter within a lengthy

duration available. In addition, through student organizing, students may discover problems that must be handled in questions. Students can then propose the problems based on the offered texts and questions, providing examples of viable solutions and necessary steps to solve them. Furthermore, students assess and evaluate the outcomes of the provided solutions and activities during the final phase of conclusion.

The steps of the PBL model make it easy for each student to complete PISA-like reading literacy questions. Students' reading literacy abilities can be enhanced through PBL-based instructional activities (Lin et al., 2017; wolk, 2022; Almulla, 2020). During the learning process in the PBL-based classroom, students are more engaged in health-related problem discussions and inquiries. Using the PBL model with this contextual approach will enhance students' problem-solving abilities. According to Mustofa et al. (2016), when students use the PBL model and the contextual approach, they are better able to solve problems and achieve higher learning accomplishments, mainly using a lesson study basis. According to the findings from the interviews with students, completing PISA-like reading literacy questions using health context is more exciting and easier than answering non-contextual questions because it is closer to students' daily lives. Willms (2010) stated that using real contexts in assessments can improve student learning outcomes.

### 5.3 Students' Literacy Skills

Reading literacy is the ability to understand, apply, evaluate, ponder, and interact with texts to achieve one's goals, develop one's knowledge and potential, and participate in society (Alwi et al., 2021). Based on students' answers at the field test stage, it is known that the questions developed can bring up indicators of students' literacy skills, namely, reading literacy skills that emerge during the field test activity with PISA-like reading literacy questions, which include locating information by accessing and retrieving information within a text, then searching and selecting relevant text (L1), understanding by representing literal meaning, and integrating and generating inferences (L2), and evaluating and reflecting by assessing quality and credibility, reflecting on content and form, detecting and handling conflicts (L3). Students' reading literacy skills can be seen from the way students answer questions and provide reasons for solving problems. This shows that students' reading literacy skills emerge when working on questions.

#### 5.3.1 Locating Information (L1)

Students were able to answer the PISA-like reading literacy questions number 1 (see figure 5) and number 2 (see figure 6) on the field test, as determined by the analysis of their field test answers. There were indications of reading literacy, specifically the ability to locate information by accessing and retrieving it from a

text (L1). As can be seen in Figures 5a and 5b, students answered a question with the L1 and L3 indicators. Prior to reaching the L3 cognitive level, students engaged in the L1 cognitive process of identifying information in the text. Therefore, when students are given questions involving L3, they must have proficiency in L1, L2, and L3. In accordance with Alwi (2022) and Fadhillah & Emilia (2022), readers must peruse a succession of paragraphs to retrieve specific knowledge before answering a question. They must scan a single text in order to retrieve several words, sentences, or numeric values. As in the case of Figures 5a and 5b, as shown in Figures 6a and 6b, the students were competent enough to successfully complete the PISA-like reading literacy problem. Figure 6a depicts a student's answering the question using the L3 cognitive process. Before attaining L3, students select information from the available text prior to responding to questions (L1). This is in line with Karakoc et al. (2022), who stated that to understand reading comprehensively, it requires using sources other than the text being read. The students implemented reading literacy abilities as they were able to access and retrieve information from within text. In accordance with Alwi (2022), achieving reading literacy requires a technique of accessing and retrieving information within text. This is supported by the ability to explain answers by providing sources of information outside of the text being read and providing steady statements based on facts and data (Ismail-Ahmad, 2022).

#### 5.3.2 Understanding (L2)

The second indicator of students' reading literacy is their ability to solve PISA-like reading literacy questions, as the question number 1. As shown in Figures 5a, 5b, and 5c, the students could accurately answer the problem using the cognitive evaluation process (L3). To achieve L3, students must use L2, namely, understanding, by analyzing and integrating sections of the expanded text to produce a comprehension of the text's meaning. This is consistent with the statements of the OECD (2018) and Iksanza et al. (2019) that text comprehension can be viewed as the reader's mental construction of the text's meaning. Figure 5c shows an incorrect student answer. The student's cognitive process in Figure 5c was confined to comprehension (L2), i.e., comprehending the literal meaning of texts without employing logical thought and reasoning. Despite this, the student had utilized their reading literacy skills when answering the question.

As shown in Figures 6a and 6c, indicators of the literacy skill of understanding (L2) were depicted when students engaged in the PISA-like reading literacy problem number 2. Figure 6a shows that the student successfully answered the question using the L3 cognitive process; yet, before the student reached L3, they comprehended the question through direct or paraphrased matches between the question and the target material in the text. This is consistent with the OECD (2019), Mirizon et al. (2021), and Chintia et al.

(2019) that literal comprehension tasks need a direct or paraphrased match between the question and the passage's target material. Locally, the reader may need to organize or simplify information. By contrast, Figure 6c shows an incorrect student answer. The cognitive process that the student in Figure 6c underwent was confined to L1 (locating information by accessing and retrieving information within a text) and L2 (understanding the text's literal meaning without the need for logical reasoning and thought). In addition, the student did not use any additional sources to answer the question, but they did use an indicator of reading skills, namely, understanding (L2).

### 5.3.3 Evaluating and Reflecting (L3)

Students' answers to the PISA-like reading literacy questions numbers 1 and 2 revealed the third indicator of their reading literacy skills. According to Figures 5a, 5b, and 5c, as well as Figures 6a and b, some students could correctly answer questions requiring a cognitive evaluation process, i.e., assessing quality and credibility (L3). L3 is a measure of reading literacy in which proficient students can reason beyond the literal or inferential interpretation of the text they read. They can reflect on the content and form of texts and critically evaluate the quality and validity of the information. This is illustrated by Figures 5a, 5b, 6a, and b. Further, in Figure 5a, the student's answer fell into the correct category and were backed by a correct explanation. The student was able to answer the question using a variety of cognitive processes, including accessing information in the text through a comprehensive reading process (L1), comprehending the reading by understanding the literal meaning of the sentences in the task (L2), and answering logically and critically through the evaluation process by identifying information in the text and considering answers from a variety of perspectives. The ability to connect information from the text being read with information from outside the text, such as information from experience, logic, and reasoning, can help children achieve reading literacy skills by evaluating quality and credibility. This is consistent with Winarti (2016), who noted that students' problem-solving abilities may be depicted in their application of reasoning and logical thinking obtained through PISA-like reading literacy.

Then, as shown in Figure 5b, the student provided a proper solution and logical explanation from a different perspective. This is consistent with McKie et al. (2012) and Amir et al. (2023), who stated that students' reading literacy skills can be seen through diverse problem-solving strategies. Unfortunately, the student in Figure 5c had yet to achieve the L3 cognitive process, as they were still at L2, namely, comprehending the text's literal meaning without employing logical reasoning and thought. On this, Ali (2022) explained that students' problems in comprehensive reading are sourced from a lack of courage in giving statements or reasons in answering questions.

On the other hand, Figure 6a shows that the student's answer was in the correct category and the reason provided was correct. The student was able to respond to the question using multiple cognitive processes, namely, L1 and L2. The student could also answer critically and provide a logical argument through the evaluation process by identifying textual information and considering replies from multiple perspectives. Integrating information from the text being read with information from outside the text, such as from experience, logic, and reasoning, can help students attain reading literacy by evaluating the quality and credibility of the material. This is consistent with the findings of Stedler et al. (2020), who stated that questions that integrate problem-solving and reasoning enhance the ability to solve PISA-like questions.

This research has produced a product in the form of health-related reading proficiency questions comparable to PISA ones. The elements were created with the PISA 2022 framework in mind (Hesse et al., 2015; Gravemeijer et al., 2017). Employing L1–L2 cognitive processes, these questions seek to improve critical thinking skills through the process of reading reasoning. This research has been conducted several times, but the most recent items used have been health-related question items entitled "Eggs and Health" and "Bathing the Baby." The use of the health context is anticipated to improve students' reading comprehension because the circumstances used are authentic (Nusantara & Putri, 2021; Zulkardi and Putri, 2006). The PISA 2022 framework was actually utilized during the development of these items. Students undergo a cognitive process consisting of L1 (locating information by accessing and retrieving information within a text), L2 (understanding the text's literal meaning without the need for logical reasoning and thought), and L3 (Evaluate by assessing quality and credibility) when answering question items (OECD's 2018; Iksanza et al., 2019).

The findings of the study demonstrated that students were able to work effectively on items after the items were undergoing the research process and some revisions based on numerous comments and suggestions. This shows that the items created are valid, practical, and effective. The problem, however, is that the texts used are too lengthy, so that students have difficulty comprehending them. Therefore, it is hoped that future research may produce concise and understandable texts.

## 6. Conclusion

Students need high-level questions that can enhance their critical thinking through a process of reasoning. This can be facilitated by employing the PISA 2022 framework in conjunction with real-world contexts. The process of increasing literacy can be accomplished by providing students with instructional materials in the form of queries that encourage them to consider the three reading literacy skills.



This research showed how students worked on two valid and practical PISA-like reading literacy questions in the forms of news items with health contexts utilizing problem-based learning. The topics used for the news items were "Eggs and Health" and "Bathing the Baby". The questions were designed using level 6 of the PISA 2022 framework with brief descriptions. The goals of the development of the questions were to assist students in practicing solving problems in everyday situations and to serve as a reference prior to taking the MCA.

Moreover, the PISA-like reading literacy questions help students address difficulties by utilizing reasoning, logical thinking, and critical thinking abilities based on experience and knowledge outside the health material they have studied. In this way, students can improve their literacy skills, namely, locating information by accessing and retrieving information within a text and then searching and selecting relevant text (L1), understanding by representing literal meaning and integrating and generating inferences (L2), and evaluating and reflecting by assessing quality and credibility, reflecting on content and form, and detecting and resolving conflicts (L3) based on the text read. This study's limitation is that students require considerable time to peruse lengthy news articles. In addition, they are unfamiliar with answering questions that require cognitive reasoning. In other words, students must become accustomed to answering questions requiring cognitive-level reasoning in both learning and assessments. In light of this, it is recommended that a further study be conducted to strengthen the prerequisite material and provide tips for effective reading. In addition, questions should not only be used for evaluation, but also for learning.

## 7. Acknowledgements

The researcher would like to thank the school principal, teacher, and students of SMPN 59 Palembang who took part in this research. A professional grant with contract number 0111/UN9.3.1/SK/2022 provided partial financial support.

## References

- Allen, D. E., Donham, R. S., & Bernhardt, S. A. (2011). Problem-based learning. *New directions for teaching and learning*, 2011(128), 21-29.
- Alfin, J. (2019). Pengembangan materi sejarah kebudayaan islam sebagai bahan ajar literasi membaca di Madrasah Ibtidaiyah. *Journal of Islamic Education Studies*, 7(1), 71—88. <https://doi.org/10.15642/jpai.2019.7.1.71-88>
- Ali, A., Gul, N., & Sabih-UI-Hassan, S. (2022). An investigation into the reading comprehension problems faced by the Pakistani students at university level. *Journal of Literature and Linguistics*, 5(1), 134-148.
- Almulla, M. A. (2020). The effectiveness of the project-based learning (PBL) approach as a way to engage students in learning. *SAGE Open*, 10(3). <https://doi.org/10.1177/2158244020938702>
- Alwi, Z., Zukardi, Putri, R. I. I., Syamsuryadi., & Nisphi, M. L. (2022). Pentingnya LKPD berbasis framework PISA 2022 untuk menguatkan kompetensi literasi membaca siswa SMP. In Nugraha, N. B. S., Fridayantlii, Giri, P. A. S. P (Eds.). *Proceeding SANDIBASA I* (Seminar Nasional Pendidikan Bahasa dan Sastra Indonesia I). (Vol, pp. 257—274), UPGRi Mahadewa Indonesia. <https://ojs.mahadewa.ac.id/index.php/sandibasa/article/view/2018>
- Alwi, Z., Zukardi., Putri, R. I. I., & Puspita, L. (2021). Pengembangan soal penalaran literasi berbasis penilaian kompetensi minimum dan sesuai standar PISA. *LOGAT: Jurnal Bahasa Indonesia dan Pembelajaran*, 8(2), 178-198.
- Amir, A. (2014). Kemampuan penalaran dan komunikasi dalam pembelajaran matematika. *LOGARITMA: Jurnal Ilmu-ilmu Kependidikan dan Sains*, 2(1), 27—42.
- Amir, J., Dalle, A., Dj, S., & Irmawati, I. (2023). PISA assessment on reading literacy competency: Evidence from students in urban, mountainous and island areas. *Jurnal Kependidikan*. 9 (1), 107-120. <https://doi.org/10.33394/jk.v9i1.7103>
- Angga, R. U. D., Arnita, & Rajagukguk, W. (2022). Differences in students' mathematical communication ability and self-efficacy between open ended and contextual learning approach. *Journal of Education and Practice*. 13(7), 19-25
- Bahri, A., Corebima, A. D. (2019). Improving PBL in Empowering Meta cognitive Skill of Students. *Indian Journal of Science and Technology*, 12(17), 1-9.
- Bakker, A. & Wagner, D. (2020). Pandemic: Lessons for today and tomorrow?. *Educational Studies in Mathematics*, 104(1), 1—4. <https://doi.org/10.1007/s10649-020-09946-3>.
- Chang, N., Wang, Z., Hsu, S. H. (2020). A comparison of the learning outcomes for a PBL-based information literacy course in three different innovative teaching environments. *Libri*, 70(3), 213—225. <https://doi.org/10.1515/libri-2018-0132>.
- Chintia, G. R., Vianty, M., & Rosmalina, I. (2019). An Investigation into students' PISA reading literacy performance and reading engagement. *The Journal of English Literacy Education: The Teaching and Learning of English as a Foreign Language*, 5(2), 118-143.

- Dazhi, Y., Shannon, S., Fe, G. (2021). An investigation of teacher experiences in learning the project-based learning approach. *Journal of Education and Learning (EduLearn)*, 15(4), 490-504. <https://doi.org/10.11591/edulearn.v15i4.20302>
- De Bortoli, L. (2021). How much effort are students putting into PISA? *Snapshots*, 16(1). <https://research.acer.edu.au/snapshots/vol16/iss16/1>
- Dizier, P. S. & Moens, M., F. (2011). Knowledge and reasoning for question answering: Research perspectives. In *Journal of Information Processing & Management*, 6(47), pp 899-906. <https://doi.org/10.1016/j.ipm.2011.04.001>
- Emilia, E., Sujatna, E. T. S., & Kurniasih, N. (2022). Training teachers to teach PISA-like reading: A case in Indonesia, *Indonesian Journal of Applied Linguistics*, 12(1), 56-76. <https://doi.org/10.17509/ijal.v12i1.46534>
- Fadhillah, A. M., & Emilia, E. (2022). Exploring Teachers' Ability In Developing PISA-Like Reading Tasks. English Review: *Journal of English Education*, 10 (3) (2022), 1057-1068 . DOI: <https://doi.org/10.25134/erjee.v10i3.6351>
- Gebremariam H. T. & Gedamu, A. D. (2022). Assessment for learning strategies: Amharic language teachers' practice and challenges in Ethiopia. *International Journal of Language Education (IJoLE)*, 6(2), 128-40. <https://doi.org/10.26858/ijole.v6i2.20505>
- Gravemeijer, K., Stephan, M., Julie, C., Lin, F., & Ohtani, M. (2017). What mathematics education may prepare students for the society of the future?. *International Journal of Science and Mathematics Education*, 15(1), 105-123. <https://doi.org/10.1007/s10763-017-9814-6>
- Harahap, N. (2020). The effect of CTL (Contextual teaching and learning) on students' speaking descriptive text ability (A study at the eighth grade of MTs Jabalul Madaniyah in 2020/2021 academic year). *Jurnal LINER (Language Intelligence and Educational Research)*; 3 (3), 153-169.
- Hesse, F., Care, E., Buder, J., Sassenberg, K., & Griffin, P. (2015). A framework for teachable collaborative problem-solving skills. In *Assessment and teaching of 21st century skills* (pp. 37- 56). Springer. [https://doi.org/10.1007/978-94-017-9395-7\\_2](https://doi.org/10.1007/978-94-017-9395-7_2)
- Hewi, L. & Shaleh, M. (2020). Refleksi hasil PISA (The programme for international student assesment): Upaya perbaikan bertumpu pada anak usia dini, *Jurnal Golden Age Universitas Hanzamwadi* 4(1), 30—41. <https://doi.org/10.1177/01614681101120040>
- Ikhsanza, C. S., Vianty, M., & Rosmalina, I. (2019). Reading literacy performances of state senior high school students in Ilir Barat i district as measured by PISA reading literacy test 2009 in English and bahasa Indonesia. *International Seminar and Annual Meeting BKS-PTN Wilayah Barat*; 1 (1). <https://repository.unsri.ac.id/12469/>
- Iskandar, I., Sumarni, S., Dewanti, R., & Asnur, M. N. A. (2022). Infusing digital literacy in authentic academic digital practices of English language teaching at universities. *International Journal of Language Education (IJoLE)*, 6(1), 75-90.
- Ismail-Ahmad, M., Bardan, M. Z., Mohd Radwan, R., & Sarmin Panut, N. F. (2022). Reading preference and motivation elements in reading habit research. *Journal of Information and Knowledge Management (JIKM)*, 1, 319-325.
- Johnson, E.B. (2010). *Contextual teaching & learning: menjadikan kegiatan belajar-mengajar menyenangkan dan bermakna*: Kaifa.
- Jubhari, Y., Sasabone, L., & Nurliah, N. (2022). The effectiveness of contextual teaching and learning approach in enhancing Indonesian EFL secondary learners' narrative writing skill. *REiLA: Journal of Research and Innovation in Language*, 4(1), 54-66. <https://doi.org/10.31849/reila.v4i1.8633>
- Karakoç, A. I., Ruegg, R., & Gu, P. (2022). Beyond comprehension: Reading requirements in first-year undergraduate courses. *Journal of English for Academic Purposes*, 55, 101071. <https://doi.org/10.1016/j.jeap.2021.101071>
- Khamkhong, S. (2018). Developing english L2 critical reading and thinking skills through the PISA reading literacy assessment framework: a case study of Thai EFL learners. *3L: The Southeast Asian Journal of English Language Studies*, 24(3), 83—91. <http://doi.org/10.17576/3L-2018-2403-07>
- Koyuncu, İ. & Firat, T. (2021). Investigating reading literacy in PISA 2018 assessment. *International Electronic Journal of Elementary Education*. 13(2), 263—275.
- Kurniawan, T. A. (2018). Pemodelan use case (UML): evaluasi terhadap beberapa kesalahan dalam praktik. *J. Teknol. Inf. dan Ilmu Komput*, 5(1), 77. <http://dx.doi.org/10.25126/jtiik.201851610>
- Laily, I. F. (2014). Hubungan kemampuan membaca pemahaman dengan kemampuan memahami soal cerita matematika sekolah dasar. *Eduma: Mathematics Education Learning and Teaching*, 3(1), 52-63. <http://dx.doi.org/10.24235/eduma.v3i1.8>

- LaRusso, M., Kim, H. Y., Selman, R., Uccelli, P., Dawson, T., Jones, S. & Snow, C. (2016). Contributions of academic language, perspective taking, and complex reasoning to deep reading comprehension. *Journal of Research on Educational Effectiveness*, 9(2), 201-222. <https://doi.org/10.1080/19345747.2015.1116035>
- Lin, L. F. (2017). Impacts of the problem-based learning pedagogy on English learners' reading comprehension, strategy use, and active learning attitudes. *Journal of education and training studies*, 5(6), 109-125. <https://doi.org/10.11114/jets.v5i6.2320>
- Marpaung, A. P., Yanti, I., & Marzuki, Y. (2019). Developing students' reading comprehension using STAD strategy: A classroom action research at SMA Negeri 7 Pekanbaru. *REiLA: Journal of Research and Innovation in Language*, 1(1), 10-16. DOI: <https://doi.org/10.31849/reila.v1i1.2775>
- McKie, B. K., Manswell Butty, J. A., & Green, R. D. (2012). Reading, reasoning, and literacy: Strategies for early childhood education from the analysis of classroom observations. *Early Childhood Education Journal*, 40(1), 55-61.
- McNamara, D. S. (2004). SERT: Self-explanation reading training. *Discourse processes*, 38(1), 1-30. [https://doi.org/10.1207/s15326950dp3801\\_1](https://doi.org/10.1207/s15326950dp3801_1)
- Mirizon, S., Vianty, M., Rosmalina, I., & Erlina, E. (2021). Secondary school students' English literacy achievement based on PISA reading literacy test 2009. *Englisia Journal*; 9 (1); 165-182. <http://dx.doi.org/10.22373/ej.v9i1.9459>
- MNE. (2007). *Materi sosialisasi dan pelatihan kurikulum tingkat satuan pendidikan (KTSP) SMP*. Pusat Kurikulum Depdiknas.
- Mo, J. (2019). "How does PISA define and measure reading literacy?", *PISA in Focus*, No. 101. OECD Publishing.
- MoECRT. (2020). *Development of minimum competency assessment question*. [in Bahasa]. Pusmenjar Kemdikbud.
- MoECRT. (2019). *Kebijakan merdeka belajar: 4 pokok kebijakan pendidikan*. MoEC.
- MoECRT. (2019, December 11). *MoECRT sets four principles of educational policy "Merdeka Belajar"* [in Bahasa]. Kemdikbud. <https://www.kemdikbud.go.id/main/blog/2019/12/mendikbud-tetapkan-empat-pokok-kebijakan-pendidikan-merdeka-belajar>.
- Munaka, F., Zulkardi., & Purwoko. (2013). meningkatkan kemampuan siswa menyelesaikan soal kontekstual melalui cooperative learning di kelas VIII 1 SMP Negeri 2 Pedamaran OKI. *Jurnal Pendidikan Matematika*, 3(1), 1-9.
- Muslich, M. (2007). *ktsp pembelajaran berbasis kompetensi dan kontekstual*. Bumi Aksara.
- Mustofa, Z., Susilo, H., & Al Muhdhar, M. H. I. (2016). Penerapan model pembelajaran problem-based learning melalui pendekatan kontekstual berbasis lesson study untuk meningkatkan kemampuan memecahkan masalah dan hasil belajar kognitif siswa SMA. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 1(5), 885-889.
- Namaziandost, E., Razmi, M. H., Ahmad Tilwani, S., & Pourhosein Gilakjani, A. (2022). The impact of authentic materials on reading comprehension, motivation, and anxiety among Iranian male EFL learners. *Reading & Writing Quarterly*, 38(1), 1-18. <https://doi.org/10.1080/10573569.2021.1892001>
- Nation, I. S. P. & Macalister, J. (2010). *Language curriculum design*. Routledge.
- Nieveen, N. (2007). Formative evaluation in educational design research. In N. Nieveen & T. Plomp (Eds.), *An Introduction to Educational Design Research*, pp. 89—102. SLO.
- Nusantara, D. S., & Putri, R. I. I. (2021). Designing PISA-Like mathematics task using a covid-19 context (PISAComat). *Journal on Mathematics Education*, 12(2), 349-364.
- OECD. (2018). *PISA 2022 Reading Framework*. OECD Publishing.
- OECD. (2019a). *PISA 2019 Result Combined executive Summaries*. Columbia University.
- OECD. (2019b). *PISA 2018: Insights and interpretations*. OECD Publishing.
- OECD. (2022). *PISA 2022 Assessment and Analytical Framework*. OECD Publishing.
- Palengka, I. (2014). Efektivitas pendekatan kontekstual untuk meningkatkan hasil belajar siswa kelas VIII SMP kristen kandora. *Jurnal Keguruan dan Ilmu Pendidikan*, 3(2), 575-582.
- Pranowo, D. D. (2011). *Alat Ukur Keterbacaan Teks Berbahasa Indonesia*. FBSS Universitas Negeri Yogyakarta.
- Pratiwi, R. P., Alwi, Z., Zulkardi., Putri, R. I. I., Samsuryadi., Meryansumayeka, Nusantara, D. S., Jayanti., Sistyawati, R. I., Tanjung, A. L., Sepriyani, S. P., & Aprilisa, S. (2021). Development of literacy reasoning questions in the COVID-19 context with inquiry method for secondary school. Students. In Prahmana, R. C. I., (Eds.) *Proceedings of the Eighth Southeast Asia Design Research (SEA-DR) & the Second Science, Technology, Education, Arts, Culture*,



- and Humanity (STEACH) International Conference. Aceh: Unsyiah. <https://conference.unesa.ac.id/conference/seadr8/index.php/seadr-steach/seadr-steach/paper/view/89>
- Puspitasari, L., Alwi, Z., Suhardi, S., & Zulkardi. (2021). Literacy questions based on hots using context COVID-19. *Journal of Education Research and Evaluation*, 5(4), 624-632. <https://doi.org/10.23887/jere.v5i4.33870>
- Putri, R. I. I. & Zulkardi. (2020). Designing PISA-like mathematics task using Asian Games context. *Journal on Mathematics Education*, 11(1). 135-144. <https://doi.org/10.22342/jme.11.1.9786.135-144>
- Rahmawati, A., Sarwi., & Darsono, T. (2019). Penyusunan bahan ajar ipa fisika sebagai upaya peningkatan literasi sains peserta didik pada tema bunyi. *UPEJ Unnes Physics Education Journal*, 8(2), 192-207. <https://doi.org/10.47178/jkip.v3i2.177>
- Rojas-Torres, L., Ordóñez, G., & Calvo, K. (2021). Teacher and student practices associated with performance in the PISA reading literacy evaluation. *Front Educ.* 6:658973. <https://doi.org/10.3389/educ.2021.658973>
- Saleh Alharbi, A., Abdullah Alhebshi, A., & Meccawy, Z. (2021). EFL students' and teachers' perceptions of Google forms as a digital formative assessment tool in Saudi secondary schools. *Arab World English Journal (AWEJ) Special Issue on CALL*, (7), 140-154.
- Saputri, N. W., & Zulkardi, Z. (2020). Pengembangan LKPD pemodelan matematika siswa smp menggunakan konteks ojek online. *Jurnal Pendidikan Matematika*, 14(1), 1—14.
- Segers, E., & Verhoeven, L. (2016). How logical reasoning mediates the relation between lexical quality and reading comprehension. *Reading and Writing*, 29(4), 577-590. <https://doi.org/10.1007/s11145-015-9613-9>
- Sempé, L. (2021). *School-level inequality measurement based categorical data: a novel approach applied to PISA*. <https://ueaeprints.uea.ac.uk/id/eprint/81609/>
- Şen, M., & Öztekin, C. (2019). Interaction among Contextual Knowledge and Pedagogical Content Knowledge: Sociocultural Perspective. *Eğitim Ve Bilim-Education and Science*. 44(8), 57-97.
- Sofou, E., & Jiménez Ramírez, M. (2020). The preschool PISA: A new paradigm of children's assessment in early childhood education. 28 (90), 1068-2341. <https://doi.org/10.14507/epaa.28.5079>
- Stadler, M., Herborn, K., Mustafić, M., & Greiff, S. (2020). The assessment of collaborative problem solving in PISA 2015: An investigation of the validity of the PISA 2015 CPS tasks. *Computers & Education*, 157, 103964. <https://doi.org/10.1016/j.compedu.2020.103964>
- Utami, W. B. (2019). Student experience about higher order thinking skill with contextual learning based ethnomathematics using learning media and math props. *International Journal of Recent Technology And Engineering*, 8(IC2), 719-721.
- Vladimir GUȚU. (2020). Contextual Academic Curriculum: An Innovative Approach. *Studia Universitatis Moldaviae: Stiinte Ale Educatiei*, 139(9), 9-18. <https://doaj.org/article/89ee6efd46044f8393368a395470fed0>.
- Wahyuningrum, T., Zulaeha, I., & Syaifuddin, A. (2018). Keefektifan pembelajaran menyusun teks diskusi bermuatan multikultural menggunakan model inkuiri sosial dan inkuiri terbimbing pada siswa kelas VIII SMP *Jurnal Pendidikan Bahasa Indonesia*, 6(2), 208-216. <http://dx.doi.org/10.30659/j.6.2.208-216>.
- Willms, J. D. (2010). School composition and contextual effects on student outcomes. *Teachers College Record*, 112(4), 1008-1037.
- Winarti, S. (2016). *Analisis kemampuan penalaran siswa dalam menyelesaikan soal serupa PISA pada siswa kelas VIII* [Dissertation, Universitas Muhammadiyah Surakarta]. UMS Library. <https://eprints.ums.ac.id/40554/>
- Wolk, S. (2022). Clearing up misconceptions about project-based learning. *Phi Delta Kappan*, 104(2), 26–31. <https://doi.org/10.1177/00317217221130630>
- Zulkardi, Z. (2002). *Developing a learning environment on realistic mathematics education for Indonesian student teachers*. University of Twente.
- Zulkardi., Ratu., I.I.P., Intan, B.K., Achmad., D.F., Ahmad, W.K., Muhammad, K.M. (2021). Islamic financial literacy in mathematics education: A proposed framework. *Proceedings of International Joint Conference on Science and Engineering 2021*. Unesa: Atlantis Press.

