

## Developing students' critical thinking abilities using the English literacy comprehension journal: A case study in Biology Education

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### KEYWORDS

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**ABSTRACT** Students must master their critical thinking ability because it is the basis for analyzing arguments so that they can develop a reasonable mindset. In addition, the critical thinking ability to speak English is also an important thing that students must possess to face the globalization era. In its development, literacy culture has become one of the skills of the 21st century. One way to improve literacy is to understand English journals for reference needs for the preparation of scientific papers in universities. Therefore, this study aims to examine students' critical thinking skills in understanding English journals in the Biology Education seminar course. This is a case study at the private universities in the city of Bandung involving 60 students in biology education. Students are given the task of reading independently from a journal. Data collection in this study was obtained from student reports in the form of PowerPoint, assessment results, and observations. Data analysis is carried out with stages of data validity, data collection, data reduction, data presentation, and conclusions. The study results showed that students' critical thinking skills in understanding English journals can be developed by integrating them into course assignments.

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### 1. INTRODUCTION

The 21st-century curriculum emphasizes students learning to think critically in mastering technology and integrating science and the real world. Acquiring these skills can be achieved by applying learning techniques that are appropriate to the subject matter. ATCS (assessment and teaching for 21st-century skills) concludes four main aspects related to 21st-century skills, namely how to think, how to work, equipment, and life skills. Thinking methods include creativity, critical thinking, problem-solving, decision-making, and learning. According to (Agustina, 2019), critical thinking can be developed through learning in the classroom. Developing critical thinking skills and abilities can train students to become accustomed to facing challenges like solving problems with their thinking.

According to (Rahayuni, 2016), 21st-century abilities are known as 4C, namely Critical thinking and problem-solving, Communication, Collaboration, Creativity, and innovation. The ability to think critically is an ability that must be mastered by students at this time because critical thinking is the basis for analyzing arguments to develop a reasonable pattern of thinking. The importance of critical thinking was also mentioned by (Rahayuni, 2016). Critical thinking skills have been proven to prepare students to learn how to think in various scientific disciplines. Critical thinking is

more than just remembering and understanding. Remembering is storing a memory that will later be released. At the same time, understanding requires understanding of something that is read and seen, whereas, through thinking, the person is able to act on more than the information he receives (Arifianto et al, 2022). Critical thinking skills can be trained through science lessons or student-centered disciplines (Rahayuni, 2016).

Literacy culture has existed since 2003 and is one of the controls for the quality of educational services. In its development, literacy culture has become one of the skills of the 21st century. Literacy is used to facilitate access to information and problem-solving (Marmoah et al, 2022). Therefore, literacy is a fundamental thing that students must have to face in the current era of globalization. One part of literacy is reading. Literacy is a person's ability to read and write. Mastering literacy skills is one of the keys for the younger generation to achieve success. Therefore, literacy needs to be taught as early as possible. However, in reality, awareness of literacy in Indonesia is still deficient. According to a survey conducted by PISA, Indonesia is ranked 60th out of 61 countries in mastery of literacy. Literacy is not only gaining knowledge but also experience that will be used again in the future (Irianto & Febrianti, 2017).

Indonesia and all ASEAN countries agreed to the MEA (ASEAN Economic Community) agreement to create a free

market (Sekretariat Nasional ASEAN - Indonesia, 2017). This requires every member of the community to be professional and be able to use English to communicate or compete with people both in Southeast Asia and others. English is studied in Indonesia by elementary to university students and is required to master four English skills, namely reading, listening, writing, and speaking. Therefore, Indonesians must have good English literacy (Ayu, 2020).

English literacy is the ability to understand English as seen from reading and writing English texts (Nurul & Hakim, 2019). Literacy focuses not only on reading and writing but also on the ability to identify, understand, interpret, create, communicate, and calculate using printed and written materials related to various contexts (OECD, 2001). Literacy has the same basic proficiency and allows the transfer of literacy-related cognitive skills from one language to another (Mayer & Trezek, 2020). Reading literacy is a fundamental way and has a vital role in education and social development. One way to make literacy learning meaningful and relevant for students is to focus on more authentic literacy tasks and activities (Gambrell, 2015). Regarding students' ability to understand the contents of textbooks, educators need to provide instructions and tools to improve their students' understanding abilities. The tools used in obtaining students' textbook reading comprehension skills research shows that several tools can be applied, such as reading and vocabulary inventories, qualitative reading inventories, and reading journals (Winiharti et al, 2014).

Journal reading literacy is the ability to understand and evaluate the contents of scientific journals. Scientific journals are academic publications that contain research conducted by experts in specific fields. Journal reading literacy is essential for students, researchers, and anyone interested in exploring specific topics. The existence of electronic journals is becoming a trend among universities as a research reference that contains the latest issues from research results. Electronic journal services can meet the information needs of the academic community in a comprehensive, complete, more practical, fast access, and up-to-date manner according to developments in science and technology (Jamaluddin, 2015). Journals are an essential part of library collections and are a vehicle for global scientific communication. The extraordinary developments in recent years have given a tremendous impetus to electronic publishing. As a result, the information generated with a modem and appropriate software can produce and distribute electronic journals via computer networks so that journal publishing becomes global (Andini, 2020).

The role of educators is also significant in creating effective learning in the classroom (Mellati & Khademi, 2022). According to (Stiggins, 2006), low literacy levels of educators can result in inaccurate assessments of student abilities, which cause students to fail to reach their full potential. The role of the educator has a significant impact on students' writing achievement. Therefore, the role of educators and students is significant in improving literacy habits. This is also supported by the statement (Fathurohman et al, 2014), which states that students' low literacy is influenced by many things, including educators' teaching models, learning facilities, learning resources, teaching materials, and the education system.

Based on the background above, this research aims to examine students' ability to think critically by understanding English journals in biology education seminar courses.

Several previous studies examined how to increase English literacy by partnering with librarians (Ayu, 2020), how students' English literacy in taking tests (Sepniwati, 2022), and how to increase students' ability to understand books, ebooks, and language articles/journals? English (Fitria & Heliawan, 2017). Therefore, researchers tried to conduct a case study to examine students' abilities in understanding English journals.

## 2. METHOD

This research method uses a case study. A case study is a study that examines in depth a phenomenon that occurs in a specific setting or context (Djiwandono & Yulianto, 2023). The case study was conducted on students of the Biology Education study program semester VII Class of 2022/2023 who contracted a biology education seminar course at a private university in the city of Bandung, Indonesia. The subjects in this study were 60 students consisting of two classes, namely class A and class B, divided into ten groups per class. Students are given the task of reading independently from a journal that has been previously agreed with the lecturer as part of their assignment. Lectures were held 16 times, with a mid-semester exam at the eighth meeting and a final semester exam at the sixteenth meeting. At the start of the lecture until the third meeting, students were explained how to search for five English journals. Then, at the fourth meeting and so on, each group presented the results of their understanding of the journal in front of the class. The criteria assessed consist of students' understanding of the title, background, methods, research results, conclusions, and bibliography. Assessment is carried out using the criteria in Table 1.

Data collection in this research was obtained from student reports in the form of power points, assessment results, and observation results. Data analysis was carried out using the stages of data validity, data collection, data reduction, data presentation, and conclusion (Miles et al, 2014).

## 3. RESULTS AND DISCUSSION

Based on the results of observations during learning and the results of the final assessment, the achievement of student's ability to understand English journals in class A.

Each group was able to understand English journals well, from the title section to the bibliography section. The group that still has less understanding than the other groups is Group 1. Group 1 still has difficulty understanding the background, methods, and research results correctly. Meanwhile, the group that has the best understanding among the other groups is groups 7, 8, 9, 10. These groups have a good understanding of the title, background, method, results, conclusions, and bibliography.

TABLE 1. Student Report Assessment Criteria

Score Range	Criteria
0 – 1.50	Less
1.51 – 2.50	Enough
2.51 – 3.50	Good
3.51 – 4.00	Very good

Based on the observation results, groups 7, 8, 9, and 10 are groups that are active in asking questions, creative, and also have good collaboration between their groups. Students from each group member had a compelling discussion pattern like in groups 7 and 9, namely that each member was given their task and then discussed the results together. Therefore, each group member has the responsibility to interpret the results of their work, and other group members discuss it to get a reasonable conclusion from each understanding of their journal. Meanwhile, the group discussion pattern carried out by groups 8 and 10 was to discuss the journal together, and each group member provided input for understanding the journal so that in the discussion, an agreement was obtained that could be used as a conclusion.

Furthermore, the achievement of students' ability to understand English journals in class B. On average, each group in class B also has a good understanding. Likewise, in class A, group 1 has less understanding than the other groups, especially in understanding the title, background, method, results, and conclusions. The groups that are better than the other groups are groups 7, 8, 9, and 10 because the averages are almost the same as the four groups. The discussion patterns of each group are not much different from the discussion patterns of groups in class A. Therefore, the average ability of students to understand English journals in class B is quite good.

The results of assessing students' ability to understand English journals can be concluded from the average achievement of students' ability to understand English journals as in Table 2.

In Table 2, it can be seen that 77.15% of students have good English journal literacy skills. 75.4% can understand the title well, 75% can understand the background well, 75% can understand the method well, 75% can understand the results well, 75% can understand the conclusion well, and 87.5% can understand the bibliography well. Overall, on average, class A is better than class B, but in general, the two are not much different. Students in class A and class B can understand English journals well.

Based on the research results, the assessment was carried out on a scale of 1 to 4, assessing the level of student's ability to understand English journals, with a value of 1 indicating low ability and 4 indicating high ability. Factors that influence include English language skills, exposure to the academic environment, curriculum, motivation, and so on. Perceptions about the importance of English journal literacy include the level of awareness and appreciation of the importance of this ability in the development of scientific writing. The results of the analysis of scientific work products reflect the level of success in using English references and the quality of the argumentation of scientific work products produced by students.

According to (Lois et al, 2022), In addition, students were given reading and writing comprehension tests as well as questionnaires indicating their perception of literacy, perceived understanding of the text, and interest in the text. According to hierarchical regression analysis, the quality of questions students produced was predicted by their ability to read, positive attitudes toward writing, and their level of understanding of the text, with significant correlations with text genre. We look at the results of literacy education pedagogy and assessment methods and suggest additional research areas. Evaluation of students' reading comprehension skills in English teaching according to (Huseynova, 2023), teachers believe that reading assessment is an essential component of effective reading instruction. Throughout the study, teachers and students appreciated the role of formative assessment in improving reading comprehension.

Meanwhile, according to (Mellati & Khademi, 2022), research results show that teacher assessment skills have a statistically significant impact on student writing, and teacher evaluation awareness leads the teaching environment to the design of effective and motivated assessors. These findings suggest that language educators consider awareness of teacher assessment in their teacher education programs. In another journal, (Lois et al, 2022) said that students also completed reading and writing comprehension tests, as well as questionnaires about their attitudes towards literacy, perceived understanding of the text, and interest in the text. Hierarchical regression analysis showed that the quality of questions students produced was predicted by reading comprehension ability, positive attitudes toward writing, and level of perceived understanding of the text, with solid effects related to text genre.

#### 4. CONCLUSION

Students' ability to think critically by understanding English journals can be developed by integrating them into course assignments. The results of this research show that 77.15% of students have good English journal literacy skills, with an average of 75.4% of students understanding the title, an average of 75% of students understanding the background of the problem, an average of 75% of students understanding research methods, an average of 75% of students understand the conclusion and an average of 87.5% of students understand the bibliography. Therefore, students' ability to understand English journals can be achieved well through collaboration in groups, learning motivation, and a supportive academic environment.

It is hoped this research can provide deeper insight into students' critical thinking skills in increasing literacy in English journals and can become a basis for educational institutions to increase students' understanding of journal literacy. Apart from that, this research can also provide valu-

TABLE 2. Average Achievement of Ability to Understand English Journals

	Title	Background	Method	Results	Conclusion	Bibliography	Rate
Class A	3.03	3.00	3.00	3.00	3.00	3.50	3.09
Class B	3.00	3.00	3.00	3.00	3.00	3.50	3.08
Rate	3.02	3.00	3.00	3.00	3.00	3.50	3.09
Percentage	75.4%	75%	75%	75%	75%	87.5%	77.15%

able information for other researchers who are interested in their research on journal literacy. Further research is recommended to explore the implications of these findings for current pedagogy and assessment practices in literacy education.

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