# Enhancing Critical Reading Through Metacognitive Scaffolding in Flipped-Classroom

Elizabeth Bunga DU[1], Joko Nurkamto[1], Nunuk Suryani[1], Gunarhadi[1]

[1] Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia

Correspondence: Elizabeth Bunga DU, Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia. E-mail: ebungadu@gmail.com

## Abstract

Critical reading is paramount for students to comprehend texts efficiently during and beyond their academic studies. Searching for and filtering information is crucial in distinguishing between important and unimportant content. Despite its significance, students often lack proper instruction in critical reading, highlighting a need for effective learning models. The Metacognitive, Scaffolding in Flipped Classroom (Ms-Flics) model addresses this gap by combining metacognitive reading and scaffolding strategies in a flipped classroom. This study evaluates the model's efficacy in enhancing students' critical reading skills. The research employs quantitative methods, conducted with grade 9 students in Surakarta, Indonesia, comparing pre- and post-treatment test results. Using cluster random sampling, two classes of 65 students were administered tests before and after the intervention. Analysis using paired T-tests revealed a significant improvement post-treatment. The findings underscore the effectiveness of the Ms-Flics model in enhancing critical reading skills among grade 9 students. The study contributes theoretically by proposing a novel learning model that integrates metacognitive reading, scaffolding strategies, and flipped classroom approaches to improve critical reading skills.

**Keywords:** Critical Reading, Metacognitive Reading, Scaffolding Strategy, Flipped-Classroom

## 1. Introduction

Critical reading allows readers to understand, integrate, analyze, and evaluate a text. Critical reading skills are one of the tools to build meaning in discourse (Ruiz de Zarobe & Gutierrez, 2024). It involves the reader selecting reading materials relevant to his needs and then reading and evaluating them critically so that the information gained from reading can be used according to his needs (Shamida et al., 2021). Acquiring substantial and compelling knowledge takes more than ordinary reading skills; critical reading translates into deeper comprehension, analytical ability, and critical thinking (Olifant et al., 2020). Surdyanto and Kurniawan (2020) state that reading must be critical, which means that reading should aim to absorb information and reflect, analyze, evaluate, and interpret the content. Critical reading involves concurrently using multiple layers of thinking in an interactive process. The thinking process includes an analysis where the reader clarifies information by examining the components of the reading, by integrating and combining the relevant parts into a coherent whole, evaluating the content by setting standards, and then assessing ideas compared to previously established standards to verify their accuracy (Spirovska, 2022).

Advances in technology includes open access to information, but not all available sources of information can be trusted. The author can more easily manipulate readers who lack critical reading skills. Social issues such as race, class, and gender in both the text and society can easily influence these readers (Castaño-Roldán & Correa, 2021). In these cases, the reader becomes passive and accepts what they read (Surdyanto & Kurniawan, 2020). Furthermore, information bias is likely inherent in digital media and may inadvertently extend to educational users. Social media is not conducive to education since it lacks a critical discourse component. Algorithms on social media are created to filter opposing views, where readers' information streams are separated into social and political opinions that correspond to their views (Ho et al., 2022; Jiang et al., 2023). Almalki (2024) found that when students are faced with reading complicated topics, especially when students do not have enough background on the topics raised, the information they provide can be inaccurate or misleading.

Critical reading skills are needed to help readers filter the information they receive. We cannot keep people from writing fake news or misleading accusations on social networks, but by being critical readers, we fortify ourselves from misinterpretations, news manipulation, and social media bullying (Corrales-Serrano, 2023; Jiménez Pérez, 2023). Students must use their critical reading skills to efficiently comprehend the texts they read during and beyond their academic studies (Hromova et al., 2022). The ability to search for information and then filter the information obtained to distinguish between important and unimportant information is a critical skill in the learning process. Making decisions about good and valid information is the cornerstone of a learning process strongly influenced by critical reading skills (Hettige et al., 2022).

Research to improve critical reading skills has been carried out and continues to this day, showing that the need for improving critical reading skills is still high. Improving critical reading skills has been a widespread issue frequently raised in reading, learning, and language

teaching research over the past few decades. The field is still relevant today for many scientists who struggle to develop efficient methods to improve students' critical reading skills and turn passive learners into critical thinkers (Hromova et al., 2022). There is a high need for research related to critical reading because of its importance in many fields, including education, business, and research. Critical reading is essential for understanding complex texts and developing critical thinking skills (Van et al., 2022). Research in this area has focused on the effectiveness of critical reading strategies, the impact of different reading environments, and the development of critical thinking skills. Some of the most popular research areas in critical thinking include online learning, cognitive ability, and judgment. The demand for research in this area is likely to continue as more and more information becomes available, and the ability to critically evaluate that information becomes increasingly important (Shamida et al., 2021; Van et al., 2022).

Although many studies have been designed to improve critical reading skills, they are still primarily done in higher education (andragogy), not lower education. Research conducted by (Shamida et al., 2021) indicated that innovative methods are required to enhance the critical reading abilities of postgraduate students, enabling them to complete their studies within the allotted timeframe and graduate punctually. Critical reading skills are essential skills required by independent readers and necessary for advanced students. However, learners with low English proficiency need to learn the basics of critical reading in their first years of higher education (Hromova et al., 2022). Yulian (2021) believed that critical thinking is a focused activity for students in higher education, where it is crucial to improve their ability to read critically.

Higher-order thinking skills (HOTS), echoed in the education system in Indonesia, has not been able to increase students' reading literacy scores in Program for International Student Assessment (PISA) 2023. The application of HOTS in language education in Indonesia has been emphasized as essential to produce high-quality human resources and prepare students to face the challenges of the 21st century. However, the PISA 2023 assessment results have shown that Indonesian students' reading literacy scores have declined since the previous 2018 assessment.
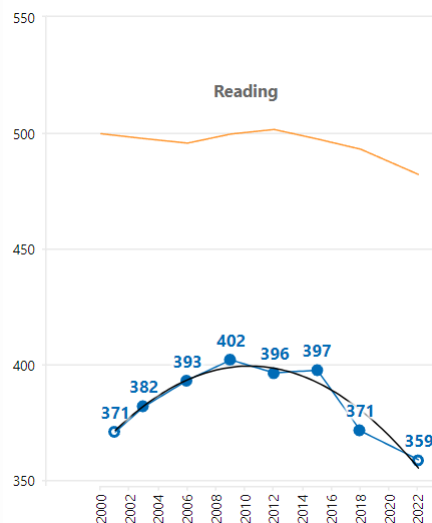


Figure 1. Trends of reading performance in the PISA test in Indonesia

The 2018 average score in reading performance was 371, while the 2022 average score was 359 (see Figure 1). The results indicated that 25% of students in Indonesia achieved Level 2 or above in reading, contrasting with the OECD average of 74%. At a minimum, these students can grasp the central concept in a moderately lengthy text, locate information according to explicit, albeit occasionally intricate, criteria, and contemplate the purpose and structure of texts when specifically prompted to do so (PISA, 2023). This fact shows that the level of reading literacy in Indonesia is still relatively low, so it is necessary to improve critical reading skills.

Although teachers understand the need for students to have critical reading skills, teachers do not have the proper learning model reference to develop students' critical reading skills. The primary differences between the widely acknowledged significance of critical reading skills and the existing deficiency among students stem from inadequate teaching practices by instructors and sporadic efforts to cultivate particular critical reading abilities without adopting a comprehensive approach (Hromova et al., 2022). Several instructional models have been developed to enhance critical reading skills. Several studies proposed the use of the flipped classroom teaching model to improve critical thinking in reading for English as a Foreign Language (EFL) learners in higher education (Hettige et al., 2022; Karapetian, 2020; Keskin, 2023; Samiei & Ebadi, 2021; Wang, 2023; Yang et al., 2022; Yulian, 2021). In addition to instructional models, supportive teaching and learning environments that allow students to have scaffolding from the teacher and other friends could enhance critical reading skills (Arora et al., 2024; Berenji, 2021; Jarvis & Baloyi, 2020; Mahan, 2022; Zuo et al., 2023). The application of metacognitive reading has also become one major factor in improving reading comprehension (Berenji, 2021; Kung & Aziz, 2020; Momdjian & El Chidiac, 2024; Olifant et al., 2020; Ruiz de Zarobe & Gutierrez, 2024; Wu & Alrabah, 2020). However, few of the teachers in Indonesia have applied the method.

Besides teachers' minimum understanding of critical reading teaching models, it is also important to note students' low reading habits. Indonesian students' lack of English critical reading can be due to several factors. One of the main reasons is that English is a foreign language in Indonesia, which means that students are not exposed to the language as frequently as they would be if it were in their native language. This lack of exposure can lead to a lack of familiarity with the language, making it more difficult for students to read and understand English texts critically (Wijayanti, 2020). The sociocultural context in Indonesia also plays a role in developing reading habits. The study proposed by Widiati et al. (2023) showed that EFL teachers serve as conduits for literacy opportunities and resources, as well as catalysts for fostering students' passion for reading and cultivating reading routines. The results imply that when teachers give students less motivation to read, they will have poor critical reading habits.

The need to have critical reading skills in the era of information-free technology is something that cannot be delayed any longer. Looking at the importance of having critical reading skills for students and the fact that the critical reading skills are not adequately taught, an appropriate learning model to enhance critical reading is needed. The Metacognitive Strategy, Scaffolding, and Flipped Classroom (Ms-Flics) learning model that combines metacognitive reading and scaffolding strategy in the flipped classroom is a solution to improve critical reading skills. This study aims to determine the effectiveness of the Ms-Flics learning model in improving students' reading skills.

## 2. Literature Review

### 2.1 Metacognitive Reading

Most researchers associate the concept of metacognition with John Flavell. Flavell (1976, p. 232) defines metacognition as "a person's knowledge of his cognitive processes and products or anything related to them". Flavell (1979) proposed three domains of metacognition, namely metacognitive knowledge, metacognitive experience, and metacognitive strategies. In the domain of metacognitive knowledge, people's knowledge refers to knowledge of oneself and others as cognitive processors. It includes knowledge and beliefs about what people think they can and cannot do well. Furthermore, it includes knowledge and beliefs about how and to what extent factors such as age, gender, intelligence, motivation, personality and educational background affect learning. Task knowledge refers to an understanding of how tasks should be managed and how likely a person is to achieve their goals. Strategy knowledge refers to the belief about which strategies are effective for achieving a goal. Flavell stated that metacognitive knowledge usually involves a combination of these three types of knowledge. Furthermore, Flavell (1979) defined metacognitive experience as a conscious cognitive or affective experience that accompanies and relates to any intellectual endeavor. Metacognitive strategies refer to using deliberate strategies to control a person's cognition. Flavell (1987) then expanded the concept of metacognition to include cognitive and affective variables explicitly. He also explained that the various domains of metacognition are often not easily separated from each other.

Metacognitive strategies in reading have different classifications. According to Zhang and Guo (2020), metacognitive reading consists of three strategies: global reading, problem-solving, and support reading. The Global Reading Strategy (GRS) assists readers in stating their reading goals that promote the improvement of vocabulary and understanding of information about a particular topic. Problem-solving strategies concern how readers solve problems faced in reading challenging texts by adjusting reading speed, rereading texts, reading aloud, and guessing the meaning of difficult words. Supportive reading strategies provide readers with additional reading techniques to apply reference materials. According to Abu-Snoubar (2017), the concept of a metacognitive reading strategy means that the reader is mentally active in regulating and monitoring the reading comprehension process. Readers organize their reading through a global strategy in the first reading stage, which can be assumed in pre-reading activities.

Meanwhile, readers apply problem-solving strategies while reading if they encounter difficulties or disturbances. Supporting reading strategies are carried out in post-reading activities to improve comprehension. The simulation of metacognitive reading strategy in pre-reading, while-reading and post-reading could be seen in figure 2. Nevertheless, it cannot be said that applying metacognitive reading strategies is only limited to the reading stage. The strategy can be used in every stage of reading.
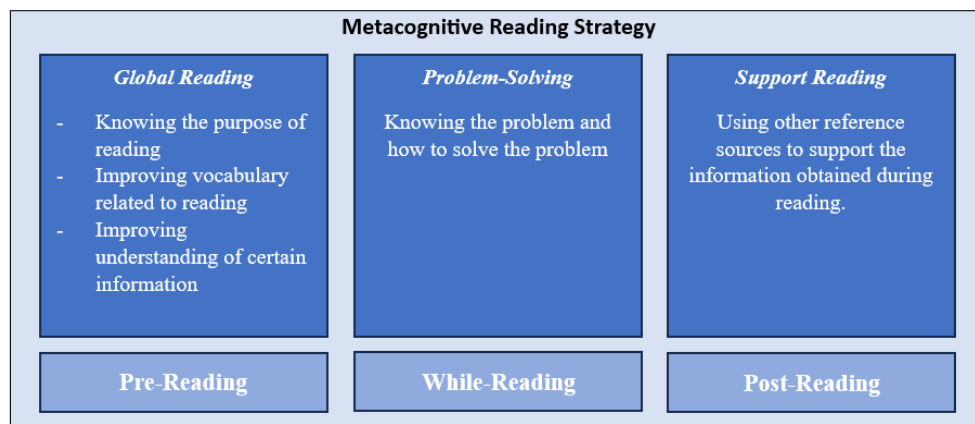
**Metacognitive Reading Strategy**

*Global Reading*
- Knowing the purpose of reading
- Improving vocabulary related to reading
- Improving understanding of certain information

*Problem-Solving*
Knowing the problem and how to solve the problem

*Support Reading*
Using other reference sources to support the information obtained during reading.

Pre-Reading | While-Reading | Post-Reading

Figure 2. Metacognitive Reading Strategy

*2.2 Scaffolding*

Two primary metaphors behind Vygotsky's (1978) work in the sociocultural theory of learning are scaffolding and the zone of proximal development (ZPD).

> *ZPD is the distance between the actual development level determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers* (Vygotsky, 1978, p. 86).

ZPD refers to the difference between what a learner can do without help and what he or she can achieve with the guidance and encouragement of a skilled partner. Thus, the term "proximal" refers to those skills that the learner "almost" mastered. Vygotsky believed that when a student is in ZPD for a specific task, providing the right help will give the student enough "encouragement" to accomplish the task (Glassman et al., 2023).
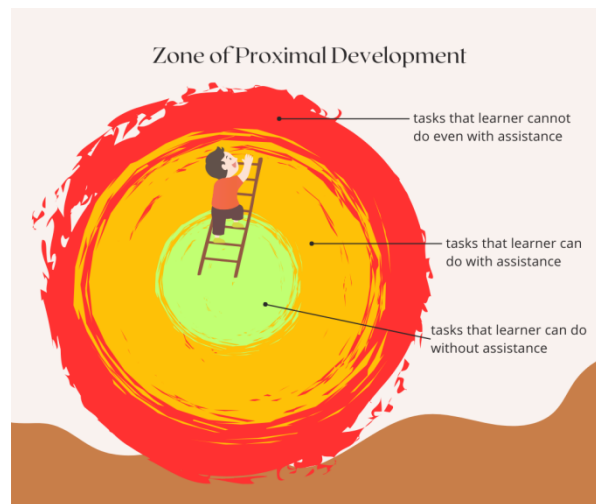


Figure 3. Zone of Proximal Development

The concept of ZPD can be seen in Figure 3. From this figure, there are three parts to student development. The sections indicated in yellow are the tasks students can do independently (without assistance). The orange part shows the *proximal* part, which shows the tasks students can do with help. The red part is the part that states tasks that students will not be able to carry out even with help (Jama, 2024).

Scaffolding can be provided by experts as well as more experienced people around the student: teachers, parents, and even peers in the same class. Emulation or support from an expert helps the learner overcome peculiar problems hindering knowledge acquisition. Scaffolding helps learners easily understand the problems they face in learning (Gehlot, 2021). Well-built scaffolds optimize student learning, provide a supportive environment, and facilitate student independence. Scaffolding strategies refer to supporting students to some extent in acquiring new skills individually. Scaffolding is a type of assistance that helps students learn new skills, concepts, or levels of understanding that lead to student success in completing tasks (Mahan, 2022). Scaffolding does not last forever, stopping once students can perform tasks beyond their current capabilities. Teacher comments and feedback allow students to take responsibility for their learning and create independence.

*2.3 Flipped Classroom*

*A flipped classroom* is a form of blended learning, which combines the concept of synchronous learning, namely face-to-face learning that usually occurs in the classroom, with asynchronous learning, which is independent learning that involves media that is usually in the form of learning videos (Rehman & Fatima, 2021). The flipped classroom learning model is widely associated with Bergmann and Sams (2011), although in their book, they state that no one owns the term flipped classroom. The basic concept of *the flipped classroom* is to exchange traditional learning where teachers provide basic concepts in the classroom and give assignments outside the classroom, in reverse to provide an understanding of basic theoretical concepts outside the classroom through media that can be accessed by students and use the classroom to deepen and apply concepts (Yulian, 2021).

Although often defined simply as "schoolwork at home and homework at school," *flipped learning* is an approach that allows teachers to apply methodologies, or a variety of methodologies, in their classrooms (Keskin, 2023). *Flipped Learning* is a pedagogical approach in which direct instruction moves from a group learning room to an individual learning room, and the resulting group space is transformed into a dynamic and interactive learning environment where educators guide students as they apply concepts and engage creatively in learning (Heredia Ponce et al., 2022).
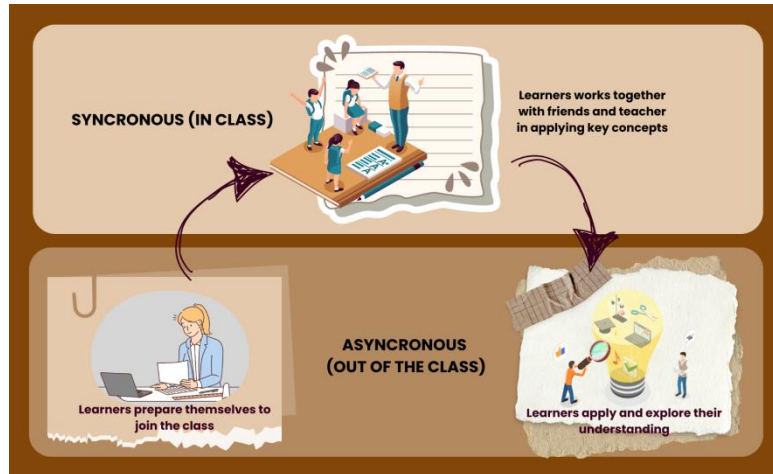
Figure 4. Flipped Classroom concept in learning

In the flipped classroom learning model, there are three stages: 1) the first stage, before class, where activities are carried out outside the classroom before the class starts. Students prepare themselves by understanding the basic concepts of the material that will be learned in class. In this activity, it is hoped that students will be able to remember and understand at the level of Bloom's revised taxonomy (Anderson & Krathwohl, 2001). 2) The second stage, in-class, is a face-to-face activity in the classroom. In this activity, students can apply and analyze the material that they understood using the basic concepts from the previous stage. This stage is carried out through interactive activities involving teachers and fellow friends to improve student understanding. 3) The third stage, after class, is an activity carried out independently outside the classroom by evaluating and producing particular works (creating) after the class ends. These stages parallel the flipped classroom with Bloom's taxonomy, as seen in Figure 5.
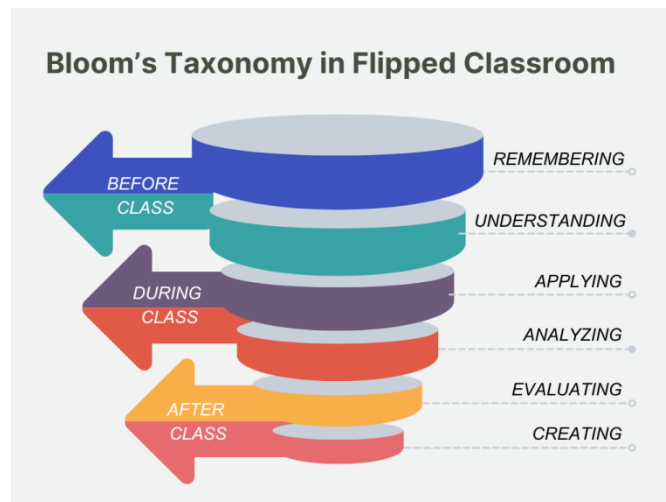


Figure 5. Relation between flipped Classroom and Bloom's Taxonomy

### 2.4 Ms.Flics Model

The concept of Ms-Flics is a combination of *Metacognitive Strategy*, *Scaffolding*, and *Flipped Classroom*, which can theoretically improve students' critical reading skills. *A flipped classroom* divides learning into two phases: the asynchronous phase, which is carried out independently by students, and the synchronous phase, which is carried out in the classroom with other students and teachers. In the learning model, Ms-Flics also uses the same phase division, namely asynchronous and synchronous. Concept of Ms-Flics teaching model could be seen in figure 6.
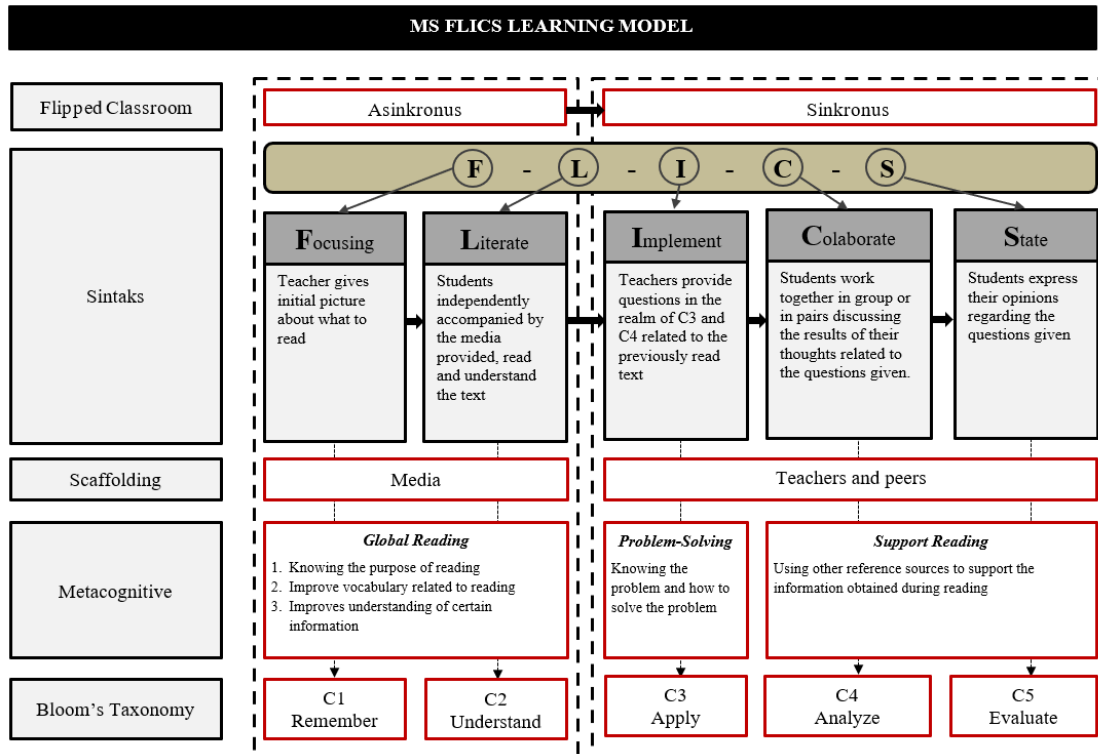
Figure 6. Ms Flics Model

## 3. Method

This quantitative research uses the Ms-Flics model to compare the average pre-test and post-test scores before and after treatment. The population of this study was students in grade 9 in the city of Surakarta, Indonesia. Two classes of 65 students were sampled using cluster random sampling.

Before treatment, tests were given to all participants to obtain pre-test scores. The test consisted of twenty-five multiple-choice questions and five essays. The instrument test was prepared based on critical reading indicators taken from revised Bloom's taxonomy, which is related to critical thinking stages in the second to fifth stages, namely: understand, apply, analyze, and evaluate (see Figure 5). The question items of this test instrument have thoroughly been validated.

Metacognitive reading, the scaffolding strategy in the flipped-classroom teaching model, is applied to classes with synchronous and asynchronous learning processes. Learning begins with an asynchronous stage outside the classroom to increase students' understanding of a text. There are two steps at this stage: *focusing,* where students start to gain information about what they will read, and *literate,* where students independently read and understand the text. Online learning platforms are used as scaffolding to help students understand readings. Metacognitive reading strategies include finding difficult words, finding word similarities, taking notes, skimming, reading details, and finding the main sentence are used in this process. Feedback is given directly in the network so students can learn from mistakes.
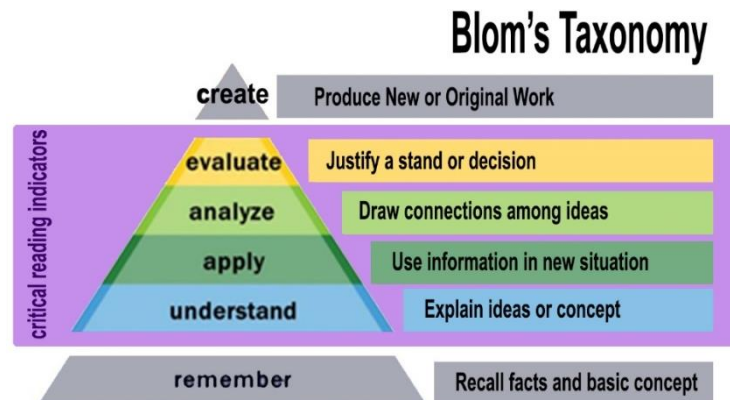


Figure 7. Bloom's taxonomy figure to critical reading

The second stage is the synchronous stage, which occurs via face-to-face learning with the main aim of improving critical reading skills. This activity has three steps: *implement,* where the teacher gives several critical questions related to the text at the asynchronous stage. Students use their knowledge to independently answer the questions, followed by the fourth step, *collaborate,* where students in groups discuss their opinions and views related to reading with the teachers' question guide, and the last step, *state,* where the student expresses their opinion personally. Scaffolding occurs in the form of teacher assistance as facilitators and peers are discussion partners. Problem-solving is the metacognitive reading strategy.

The learning process using these steps is repeated in four cycles over four weeks. After the last cycle, the test is repeated to get the post-test score. The average test results before and after treatment were analyzed using paired T-tests.

## 3. Results

### 3.1 Normality

Before performing a paired T-test, a prerequisite test, namely a normality test, was carried out on both pre-test and post-test results. The normality test used was the Lilliefors test with $N = 65$ and significance value $= 0.05$. The hypotheses proposed are as follows:

$H_0$: The population has a normal distribution

$H_1$: The population does not have a normal distribution

$H_0$ is rejected, and $H_1$ is accepted if the L obtained is smaller than the L table (Lo < Lα), while $H_1$ is rejected and $H_0$ is accepted if the L obtained is greater than the L table (Lo > Lα)

The results of the normality test are as follows.

Table 1. Normality of pre-test and post-test data

| | Mean | Standard deviation | Lilliefors obtained | Lilliefors table | Result |
|---|---|---|---|---|---|
| Pre-test | 49,692 | 17,944 | 0,090 | 0,110 | Normal |
| Post-test | 55,192 | 17,169 | 0,093 | 0,110 | Normal |

From the table above, the normality test results for the pre-test and post-test show that L obtained is higher than the L table, which means $H_1$ is rejected and $H_0$ is accepted; this also means that the data on the pre-test and post-test have a normal distribution. Thus, the next test, the paired T-test, could be carried out.

### 3.2 Paired T-Test

Paired T-tests were conducted to determine the impact of using the Ms-Flics learning model on students' critical reading skills. With $N = 65$ and $α = .05$, the hypothesis was proposed as follows:

$H_0$: There will be no significant difference between the average score before and after being subjected to the Ms-Flics learning model treatment.

$H_1$: There will be a significant difference between the average grades before and after being subjected to the Ms-Flics learning model treatment.

$H_0$ is accepted, and $H_1$ is rejected if the T count is smaller than the T table, while $H_0$ is rejected and $H_1$ is accepted if the T count is greater than the T table.

The results of the paired T-test are as follows:

Table 2. Paired T-test pre-post data result

| Sample | DF | Significant Level | T table | T count | Result |
|---|---|---|---|---|---|
| 65 | 64 | .05 | 1,998 | 8,342 | There is a significant difference |

From the results, the T count (8.342) is greater than the T table (1.998 with $N = 65$ and $α = 0.05$), then $H_0$ is rejected, and $H_1$ is accepted, which shows a significant difference from the average value before and after being subjected to the treatment of the Ms-Flics learning model. Thus, there is evidence that the Ms-Flics learning model can improve the critical reading skills of grade 9 students.

## 4. Discussion

From these results, there is evidence that grade 9 students can develop their skills in critical reading. The results imply that the development of critical reading skills can be done with college students and students in the earlier educational stages. These results are in line with what Hromova et al. (2022) expressed: given the importance of critical literacy in helping advanced EFL college students navigate through false and deceptive information, there is a growing argument for introducing the fundamentals of critical reading to lower-level English learners early in their tertiary education or even during their high school years. Additionally, post-secondary education and employment options are assumed to be limited without critical solid reading skills acquired prior to higher education (Olifant et al., 2020). Critical reading skills in the early stages of education are advantageous because they allow young learners to respond intelligently to various types of information and develop their thinking abilities (Kim & Yang, 2021). Critical literacy fosters the

development of critical thinking skills, enabling students to go beyond simple comprehension and become active participants in their reading (Hazaea, 2020). It helps them analyze, assess, and improve their thinking, communicate effectively, and acquire new knowledge.

The Ms-Flics learning model, which combines metacognitive reading and scaffolding strategies in flipped classrooms, improves students' critical reading skills because it provides the help students need during the reading process. The comprehension process occurs outside the classroom, allowing students to interact more closely with the reading. Asynchronous learning, which provides material that can be learned individually, gives opportunities for students to use as much help as they need from online media, dictionaries, and families.

Asynchronous learning has improved reading comprehension in various contexts. Studies have shown that asynchronous forums provide sufficient time for students to read extensively and discuss subject matter at their convenience, thereby increasing their level of comprehension (Severino et al., 2021; Zuhriyah & Fajarina, 2022). In addition, using asynchronous learning management systems or online platforms can support the conceptual development of English Language Learners, develop language proficiency, and provide sufficient access to learning (Shang, 2023). Asynchronous learning through e-learning improves EFL students' reading comprehension and motivation (Patra et al., 2022).

Since reading comprehension is acquired outside the Classroom, the Ms-Flics learning model provides more time in the classroom to improve the ability to integrate, reflect, and evaluate where these aspects of critical reading. The use of scaffolding, both from teacher and peer assistance, increases students' ability to criticize a text. The application of group work, where students with good English skills help students with fewer English skills, improves the scaffolding process.

Substantial evidence indicates that instructional methods focusing on interactive classroom discussions can enhance students' capacity to articulate arguments and support or refute opinions across different academic disciplines (Edwards-Groves & Davidson, 2020; Omidire, 2022). Blasco-Serrano et al. (2024) found that various elements and processes support reading comprehension, but there is little doubt that deep and critical understanding is formed by collaboration, argumentation, and independent decision-making. In this case, teachers act as guides who provide facilities that support educational development through motivation, peer dialogue, and stimulation of critical thinking. Teachers continuously encourage students to make critical decisions through interaction and collaboration. The research performed by (Rivas et al., 2022) showed that metacognitive enhancement among learners through interactional activities with reflective dialogue and debate can strengthen critical thinking. Applying the Ms-Flics learning model based on research can improve students' critical reading skills. This approach can be one of the learning models teachers can use to improve student's critical reading skills.

Critical reading skills are crucial in dealing with the rapid flow of information that is not necessarily the truth. This skill is crucial for adults and children with broad access to information due to advanced technological literacy. This research provided evidence that the Ms-Flics learning model can effectively improve the critical reading skills of grade 9 students in Surakarta. The paired T-test result shows that applying metacognitive reading and scaffolding strategies in flipped classrooms can significantly enhance students' critical reading skills. Critical reading, as the result of this study, can be applied with students in higher and lower education. This research provides evidence that critical reading can be applied and improved in grade 9 students by applying a learning model that combines metacognitive reading and scaffolding strategies in a flipped classroom. The results of this study provide theoretical implications by contributing to the development of new learning models that teachers can use to improve students' critical reading skills by combining metacognitive reading and scaffolding strategies applied in flipped classrooms.

Although this study illustrated that grade 9 students in Surakarta improved their critical reading skills by applying the Ms-Flics learning model, this research was conducted in urban areas with good internet access and students with good technological literacy. This learning model, which involves an asynchronous process, requires adjustments in its application if used with students in rural areas, and further research is needed to prove its effectiveness. Other research can apply this learning model to teach language learning that is not English. This line of study will provide a wealth of new research on developing learning models incorporating metacognitive reading and scaffolding strategies in flipped classrooms to improve critical reading skills.

**Ethics approval**

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

**Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.

**Open access**

**Copyrights**

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