

Exploring Students' Metacognitive Strategies in Digital Reading Through a Flipped Classroom: A Qualitative Research

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ABSTRACT

Digital reading requires EFL students to move beyond literal comprehension toward strategic, reflective, and critical engagement with online texts. In a flipped classroom, students read digital materials before class and use classroom time for discussion, clarification, and higher-order thinking. This study explores how EFL students develop metacognitive strategies in digital reading through a flipped classroom approach. This study employed an exploratory qualitative design involving seven undergraduate EFL students enrolled in an intensive reading course at Universitas Megarezky. The research was conducted over three meetings using a flipped classroom sequence consisting of pre-class digital reading, in-class reflection and discussion, and post-class evaluation. Data were collected through students' written reflections and semi-structured interviews. The reflection prompts focused on three dimensions of metacognitive strategies: planning, monitoring, and evaluation. The data were analysed using thematic analysis to identify patterns in students' metacognitive awareness, strategy regulation, and critical reading development. The findings revealed three major themes. First, students demonstrated surface-level metacognitive awareness in the pre-class stage, mainly focusing on vocabulary, literal meaning, and word-by-word translation. Second, students developed adaptive strategy regulation through reflection and classroom discussion, as they began modifying ineffective strategies and identifying main ideas, authorial purpose, and textual relationships. Third, students showed critical epistemic monitoring by evaluating arguments, evidence, source credibility, and distinctions between fact and opinion. The flipped classroom supported the gradual development of students' metacognitive strategies in digital reading. Structured reflection, peer discussion, and guided evaluation helped students move from basic comprehension toward more strategic and critical engagement with digital academic texts.

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1. INTRODUCTION

The development of digital learning has transformed academic reading practices, particularly in EFL contexts, where students are confronted not only with linear texts but also with complex, multimodal digital texts that require critical evaluation (Khaerani & Nahartini, 2025; Sasmiranda et al., 2025; Taufiq, A., Jubhari, Y., & Amaliah, 2025; Butarbutar et al., 2026). Reading in a digital environment presents a non-linear structure, an abundance of information, and the distractions inherent in the online ecosystem (Pahrizal et al., 2025). In this case, comprehension is no longer exclusively dependent on decoding and interpretation abilities, but also on students' knowledge of their own thought processes. How do they pick what they want to read, what information is relevant, and whether to slow down or reread? Metacognitive methods become internal processes that assist students to sustain their thought direction amongst the fluid and multidimensional complexity of digital texts (Akhiruddin et al., 2023; Limbong et al., 2024; Rinantanti et al., 2025; Sujarwo et al., 2026; Sukmawati et al., 2023; Wahid et al., 2025).

When reading activities are conducted before class activity, students are no longer in a position to receive explanations as a starting point for understanding, but rather as the primary actors constructing knowledge independently. Epistemic responsibility shifts to them. It becomes the initial way for students to create intellectual dialogue before discussions take place (Hajhashemi et al., 2017). This situation requires the ability to construct targeted reading strategies, monitor the quality of understanding in the reading, and evaluate the willingness to participate with friends in the classroom (Asdar et al., 2024; Samangun & Rosmayanti, 2024; Sasabone et al., 2023). The approach classroom risks becoming merely a change in format, rather than a transformation of the meaning of learning without adequate metacognitive awareness (Sari, 2016).

Metacognitive strategies function as "construction managers," tasked with focusing, planning, acquiring resources, arranging, managing, monitoring, and evaluating an individual's L2 knowledge process. This idea was obtained from the concept core of (Oxford, 2011). It is in line with Malley and Chamot (1990) cited in Shih & Huang, (2020) metacognitive techniques are those that entail thinking about the learning process, planning for learning, monitoring the learning task, and evaluating how well one has learned. In addition, Metacognitive strategies as Flavell, (1979) define encompass cognitive procedures that facilitate cognitive processes to attain certain cognitive objectives, including the taxonomies of planning, monitoring, and evaluation.

These metacognitive strategies are essential instruments that students deliberately select for specific tasks to manage, organize, regulate their reading processes, and assess the efficacy of their strategic application (Jaiswal, 2025; Kermani et al., 2023). Numerous researchers investigated the metacognitive listening strategies includes planning, attention directed, selective attention, monitoring and evaluation (Shih & Huang, 2020). Instruction in metacognitive methods enhances reading comprehension among low-achieving EFL readers (Sutiyatno & Sukarno, 2019). It is similar with (Ahangari & Mohseni, 2016) that the implemented methodologies have been considered beneficial for formulating pre-reading plans, assessing comprehension during reading, and appraising the material processed post-reading.

Reading comprehension is an interactive process including the recognition of written symbols, the understanding of their contextual significance, and the identification of the relationship between words and concepts (Samiei & Ebadi, 2021). It is similar with (Kintsch, 2017) in defines reading comprehension as the process of obtaining and formulating meaning from textual material. Web sites, text messaging, and blogs are digital texts. In addition, a personal computer (PC), mobile device, screen reader software, or internet posting tool can store them. They combine text, audio, video, images, and hypertext and are electronically generated (Suhartini & Ulfa, 2024).

Digital reading is a part of information literacy (IL) which is defined as the ability to think critically from a digital text such as a computer, or mobile device (Lim & Toh, 2020; Saqr, 2021). The internet and digital technologies are integral to individuals' lives from an early age. Hence, theoretical

frameworks and techniques for conventional paper-based reading activities can be adapted for screen reading activities (Sezgin, 2022).

The Information Foraging Theory (IFT) and hypertext theory are two important theories of online reading skills and material acquisition proposed by Pirolli (2007) cited in (Pardede, 2019). IFT describes user behavior during online reading, whether for casual or specific tasks inside the web environment. While hypertext show ability to generate conceptual and literal links between text sections or entire texts. Furthermore, Singer and Alexander's (2017) cited in (Reiber-Kuijpers et al., 2021) describe characteristics of (1) availability and choice of texts; (2) degrees of linearity; (3) format and layout characteristics; and (4) the integration of digital tools.

Flipped classrooms, an increasingly prominent pedagogical approach in English as a foreign language (EFL) instruction, are defined by a fundamental transformation of the traditional classroom model, utilizing technological tools Hava, (2024) to reverse the typical order of in-class instruction and out-of-class learning activities (Dewi et al., 2025; Henderson et al., 2020; Shih & Huang, 2020; Wang, 2023). Students engage with instructional material outside of class and utilize in-class time for peer discussions, knowledge application, or practical exercises (Kermani et al., 2023; Koh, 2019). The flipped learning approach's main goal is to enable students to actively and meaningfully interact with online course materials, which will foster a deeper comprehension of the material during class time (Hava, 2024).

The implementation of the Flipped Classroom in language teaching is carried out by dividing learning into three core stages. Pre-class, students study the material independently through videos, digital texts, or modules in the LMS, accompanied by directed assignments such as answering questions, summarizing, or identifying main ideas. This stage builds initial understanding and responsibility for learning. In class, time is focused on communicative practices and higher-order thinking, such as critical discussions, role-plays, text analysis, or collaborative writing. The lecturer acts as a facilitator, clarifying misconceptions and deepening understanding. Post class is conducted reflection and evaluation through formative quizzes or reflective journals to strengthen metacognitive awareness. With the right design, the flipped classroom shifts language learning from simply understanding concepts to active and meaningful language use (Khodaei et al., 2022; Wang, 2023a).

Numerous distinguishing attributes have been suggested for the flipped classroom, encompassing interactive learning (Crouch et al., 2007), real-time engagement (Novak, 2011), inverted instruction (Davis, 2013), and the flipped learning Approach (Bergmann & Sams, 2014). The role of learners transitions from passive to active, while teachers evolve from leaders to supporters and mentors (Khodaei et al., 2022). In flipped learning contexts, group activities are essential for promoting interactive and collaborative learning experiences (Adnan, 2017).

This flipped model has been considered a helpful model for improving the linguistic competency of EFL learners (Wang, 2023). Metacognitive methods employed in flipped classroom can enhance autonomous learning skills, improve academic achievement, address learning needs, and elevate enthusiasm in language acquisition (Ramadhanti et al., 2026). It encourages students to assume responsibility for their education. Consequently, students will possess greater flexibility in their learning (Khodaei et al., 2022).

Students recognize that active involvement in class is essential, and they are also more responsible for pre-class learning activities through flipped classroom approach (Henderson et al., 2020). Digital reading in L2 can boost motivation, engagement, interaction levels, and to support or encourage L2 digital reading comprehension (Reiber-Kuijpers et al., 2021). To fill the gap in this research, digital reading requires more than comprehension accuracy. It demands reflective judgment and adaptive regulation. Without examining these developmental processes, flipped classroom implementation can be reduced to a procedural change rather than a meaningful transformation of learning. This study lies in investigating the process of metacognitive development in digital reading through a flipped classroom model. It explores how EFL students move from initial surface-level

awareness to adaptive strategy regulation through reflection and classroom discussion, and finally to critical epistemic monitoring when evaluating digital texts.

Therefore, the Flipped Classroom model contributes to improving EFL students' linguistic competence and learning independence by strengthening metacognitive strategies and pre-class accountability. This active engagement is supported by digital reading in L2, which increases motivation, interaction, and comprehension, making language learning more reflective and meaningful. The conceptual framework is as follows:

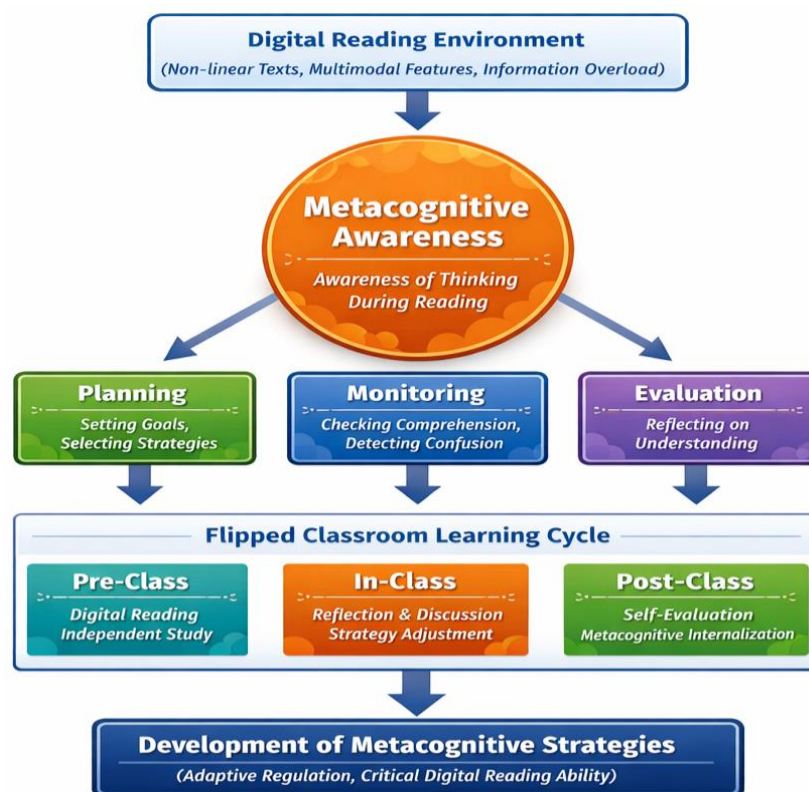


Figure 1. Conceptual Framework

This conceptual framework demonstrates that the digital reading environment, characterized by non-linear, multimodal texts and information overload, requires EFL students to activate metacognitive awareness while reading. This awareness triggers three main metacognitive strategy processes: planning, monitoring, and evaluation, which help students set reading goals, monitor comprehension, and evaluate the effectiveness of the strategies used. In the context of the flipped classroom, this process develops through three learning stages: pre-class (students read digital texts independently), in-class (reflection and discussion to adjust reading strategies), and post-class (self-evaluation and internalization of thought regulation). The interaction between digital reading and the flipped classroom cycle ultimately encourages the development of more adaptive metacognitive strategies, enabling students to engage in critical digital reading in a more reflective and directed manner.

Recent studies have examined flipped classroom can enhance students' learning outcome reading Yulian, (2021), learner autonomy (Zarouk et al., 2020) and motivation in EFL environment (GiRgiN & Cabaroğlu, 2021) . Digital reading and non-digital reading environments require special cognitive skills because of their linear structure, multimodal features, and information overload. Although various studies have shown that flipped classrooms can improve EFL students' reading learning outcomes, motivation, and learning independence, most studies still focus on learning outcomes, rather than on the metacognitive processes students experience when reading digital texts in a flipped learning environment. In fact, digital reading has more complex characteristics, such as non-linear structures, multimodal features, and information overload, which demand higher levels of

planning, monitoring, and evaluating reading strategies. Therefore, research on how EFL students develop and adjust their metacognitive strategies during digital reading activities in a flipped classroom context is still limited, and this study aims to fill this gap. The researchers investigated (1)How does students' metacognitive awareness function in the pre-class stage?, (2) How do students adapt reading strategies through reflection and class discussion? (3)How do students internalize the deep regulations in critical reading?

2. METHODS

2.1 Research Design

This study applied an exploratory qualitative design with the aim of deeply understanding the dynamics of students' metacognitive strategies in digital reading activities through a flipped classroom approach (Creswell & Creswell, 2023). The researchers chose this method because they wanted to learn more about how students plan, monitor, and evaluate their reading activities rather than using numbers to measure learning outcomes. Researchers were able to better observe how students' metacognitive strategies changed as they read digital texts for English classes by using a flipped classroom design that included pre-class activities, in-class discussions, and post-class reflections.

2.2 Research Participants

Seven first-year English as a foreign language (EFL) students at Universitas Megarezky who were taking an intensive reading course took part in this study. The study purposely chose a small group of people because it used an exploratory qualitative method that focused on getting to the bottom of how students think about how they think while doing digital reading activities in a flipped classroom. The number of participants was considered sufficient because qualitative exploratory studies prioritize depth of data rather than statistical representativeness. With a small and information-rich sample, the researchers were able to conduct detailed analysis of individual reflections and interviews. The researcher was able to get more detailed information from a smaller group of participants through semi-structured interviews and written reflections. This allowed for a more complete look at how students plan, track, and review their reading strategies.

Table 1. Demographic Data of Research Participants

No	Respondents' Code	Gender	Age	Semester	Study program	Experience in Digital reading	Reading Ability Level (Self-reported)
	R1	Female	20	4	English Education Department	Frequently using online articles and e-books	Intermediate
	R2	Female	21	4	English Education Department	Using an LMS and digital academic resources	Intermediate
	R3	Female	20	4	English Education Department	Reading articles and course materials through an LMS	Intermediate
	R4	Female	21	4	English Education Department	Using e-books and online journals	Intermediate–High
	R5	Female	22	6	English Education Department	Reading digital academic texts and educational blogs	Intermediate

R6	Female	21	6	English Education Department	Using AI tools and online articles	Intermediate–High
R7	Male	22	6	English Education Department	Reading journals and digital materials through an LMS	Intermediate

2.3 Instruments

The instruments of this study were reflection and semi-structured interviews. The written reflections were conducted during 3 meetings. Reflection prompts asked students to describe their reading goals, difficulties encountered, strategies used, and evaluation of their comprehension. In addition, interview guides were conducted once after the last meeting. Each interview lasted approximately 20–30 minutes and was conducted in a language comfortable for participants (Indonesian or English). Interviews were audio-recorded with permission and later transcribed for analysis. A more detailed research instrument was developed based on John H. Flavell's theoretical framework of metacognitive strategies: planning, monitoring, and evaluation. This study used two main instruments: written reflections and semi-structured interviews, to explore students' metacognitive strategies in digital reading activities within a flipped classroom context. The instruments were designed to identify three main dimensions of metacognitive strategies: planning, monitoring, and evaluation.

Table 2. Metacognitive Reflection Instruments in Digital Reading

No	Dimension of Metacognitive	Indicators	Reflection Questions
1	Planning	Determining reading purposes	What was your primary goal when you began reading this digital text?
2	Planning	Activating prior knowledge	What did you already know about the topic of the text before reading?
3	Planning	Choosing reading strategies	What strategies did you plan to use to understand this text?
4	Planning	Identifying important parts	What parts of the text did you think needed more careful reading?
5	Monitoring	Recognizing comprehension difficulties	Were there any parts of the text that were difficult to understand? Why?
6	Monitoring	Controlling comprehension while reading	How did you know whether you understood or not the text?
7	Monitoring	Using repair strategies	What did you do when you encountered difficult words or ideas?
8	Monitoring	Connecting ideas	How did you connect ideas between paragraphs in the text?
9	Evaluation	Evaluating comprehension	After reading, how well did you understand the text?
10	Evaluation	Evaluating strategies	What strategies helped you understand the text the most?
11	Evaluation	Reflecting on strategies	Are there any strategies you would change if you read a similar text in the future?
12	Evaluation	Critical evaluation	Did you find any weak arguments or biases in the text? Explain.

Adapted by Flavell, (1979); Buskes et al., (2025)

2.4 Procedures

This research was conducted over three sessions using a flipped classroom model consisting of three main stages: pre-class, in-class, and post-class. Each stage was designed to facilitate the development of students' metacognitive strategies in digital reading activities. In the pre-class phase, students were asked to read digital texts provided by the lecturer through an online learning platform. Students were given 2–3 days to complete the reading independently. The texts were selected from academic sources relevant to the reading course material. Texts ranged from 700–1,000 words, with intermediate to upper-intermediate difficulty, containing argumentative structures, multiple ideas, and unfamiliar vocabulary appropriate for EFL learners. Before coming to class, students had to read the texts on their own and write a short reflection about why they read, any problems they had understanding the texts, and how they used techniques to get past these problems. The point of this review was to find out what kinds of planning and checking students did while they read.

When the students were in class, they mostly talked with each other and thought critically about what they had read. Activities included identifying main ideas, comparing interpretations, evaluating arguments, and supporting opinions with textual evidence. The lecturer acts as a facilitator, guiding the discussion by asking provocative questions, helping students clarify misconceptions, and encouraging them to evaluate the strength of arguments and evidence contained in the text. This stage aims to strengthen the monitoring and evaluation of reading strategies through academic interaction and collaborative reflection.

Next, in the post-class phase, students are asked to complete a follow-up reflection assignment through SIAKAD, the Learning Management System (LMS) used by Megarezky University. The students evaluated their comprehension, reviewed strategies used, and identified improvements for future reading tasks. The lecturer then provides feedback on the students' reflections through the LMS to strengthen metacognitive awareness and encourage the development of more effective reading strategies.

Through these three stages, the implementation of the flipped classroom not only moves reading activities outside the classroom but also provides space for students to develop more conscious and reflective planning, monitoring, and evaluation of reading strategies in the context of digital reading.

2.5 Data Analysis

The research data were analyzed using thematic analysis as proposed by Braun & Clarke, (2022). The analysis process was carried out through several systematic stages: data familiarization, initial coding, theme identification, and theme review and refinement. During the familiarization stage, researchers read the written reflections and interview transcripts of the students multiple times in order to gain an understanding of the overall substance of the data during this stage. The following step was to develop the first codes based on student remarks that revealed metacognitive processes that occurred during digital reading. These codes were then grouped to identify patterns related to metacognitive awareness, reading strategy modification, and critical regulation in understanding digital texts. In the final stage, emerging themes were reviewed to ensure their interconnectedness and their alignment with the research objectives regarding the development of students' metacognitive strategies in the flipped classroom context.

The researchers independently coded a portion of the dataset and compared interpretations to improve coding reliability. Differences in coding were discussed until consensus was reached, and the coding framework was refined before analyzing the remaining data. Several strategies were applied to ensure trustworthiness, such as (1) triangulation, where findings across written reflections and interview data, (2) Member checking, where selected participants reviewed summaries of interpretations to confirm accuracy, and (3) Peer debriefing, where emerging themes were discussed with academic colleagues experienced in qualitative research.

2.6 Ethics Approval

This study received approval from the relevant institutional authority at Universitas Megarezky and followed ethical guidelines for educational research. All participants were informed about the study purpose, procedures, duration, voluntary participation, and their right to withdraw at any time without penalty. Written informed consent was obtained before participation. To ensure confidentiality, participants' identities were replaced with codes (R1–R7), and all data were securely stored and used solely for research purposes.

3. FINDINGS AND DISCUSSION

3.1 Research Findings

This section presents research findings on the development of students' metacognitive strategies in digital reading activities within the flipped classroom context. Analysis of data obtained from written reflections and semi-structured interviews indicates that students' metacognitive strategies developed gradually through three main stages: initial awareness of the reading process, strategy adjustment through reflection and class discussion, and deeper internalization of regulations in critical reading. These findings illustrate how students began to plan, monitor, and evaluate their reading. The results of this study demonstrate how students started to organize, monitor, and analyze their reading process more consciously while they were dealing with digital texts.

3.1.1 Theme 1: Surface-Level Metacognitive Awareness in the Pre-Class Stage

At first, metacognitive awareness is still limited for students. They focused on understanding word, the use of difficult words and phrases in digital writing. Most of the students used simple methods like translating word for word, searching for words and category of part of speech.

The reflection data showed that most of the students' reading goals were to understand the literal meaning in the text, not to evaluate the author's arguments or figure out how concepts are connected.

Extracts from reflections

I came to the realization that I was unable to rephrase the text's contents in my own terms. (R1)

I translated the text word by word in order to comprehend it. (R3)

R1 exhibited metacognitive monitoring by recognizing her limited comprehension when he was unable to interpret the text in her own words. In the interim, R3 employed the method of translating the text word-for-word to tools in her understanding the content of text. Both statements indicate that students are beginning to recognize their literacy challenges and are implementing specific strategies to overcome in order to comprehend the context.

Interview excerpts

"Initially, my objective was to comprehend the content; however, I am now beginning to doubt the author's arguments." (R1)

"I am still firstly concerned with comprehending the content of text, rather than evaluating the arguments." (R5)

R1 describes that students are beginning to transition from a mere comprehension of the text's content to a critical assessment of the author's arguments, whereas R5 remains concern on comprehending the context of the text without evaluating how arguments are. This indicates differences in the level of metacognitive regulation in digital reading among students.

Nevertheless, some students are beginning to demonstrate an initial awareness of the limitations of their understanding of context, which forms the basis for the development of reading strategies at later stages.

3.1.2 Theme 2: Adaptive Strategy Regulation through Reflection and Classroom Discussion

The second theme indicates that students began to regulate their reading strategies after involve in reflection activities and class discussions. Students began to recognize that their initial strategies, such as word-for-word translation to get the literal meaning, were not always effective in achieving a comprehensive comprehension of the text at this stage.

The students' reading objectives were more clearly defined in the student reflections. Extracts from reflections

I began to contemplate the author's purpose. (R5)

The conversation inspired me to recognize my inadequate comprehension. (R2)

Additionally, certain students began employing digital technologies to facilitate their comprehension of the text. I employed ChatGPT by composing a prompt that inquired about the primary concept of the text." (R6)

R5' excerpt suggests that students are beginning to ask the authors' purpose, which is indicative of the growth of metacognitive awareness in the comprehension of texts. In the interim, R2 came to the realization that his comprehension of the text was boosted by the class discussions. Furthermore, R6 utilized digital technologies such as ChatGPT to help identify the main idea of the text. These findings indicate that students are beginning to use reflection, discussion, and technology as strategies to improve digital reading comprehension.

Interview excerpts

"I started asking myself: what was the author's purpose, I'm still more focused on understanding the content first, not really evaluating the arguments. Discussion based on student questions." (R5)

"The discussion made me realize that my understanding wasn't quite right, presentation of analysis results and mutual feedback." (R2).

The R5' extract shows that students are starting to become more conscious of their own thinking by asking why the author wrote the text, but they are still more interested in understanding what the text says than judging how strong the argument is. Students' enquiries that evolve into discussions also illustrate active participation in the comprehension process. At the same time, R2 learned through the conversation that her interpretation of the text was not completely correct. The analytical presenting activity, which included feedback between students, helped them better understand the text.

3.1.3 Theme 3: Critical Epistemic Monitoring in Digital Reading

The third theme demonstrates the development of more complex metacognitive regulation. At this stage, students no longer simply read to understand the text's content, but begin to read to evaluate arguments and assess the validity of information. Reflection data demonstrates a change in students' reading purposes

Reflection excerpts

I read to evaluate the strength of an argument. I tried to compare the author's argument with other sources to see if it was convincing. I also checked whether the evidence in the text really supported the author's claim. (R7)

I distinguish between fact and opinion based on evidence and sources. (R6)

Statement R7 indicates that students have implemented critical reading strategies by evaluating the strength of the author's argument, comparing it with other sources, and examining whether the evidence presented truly supports the claims made. This is indicative of a greater degree of

metacognitive regulation, as students not only comprehend the content of the text but also evaluate the validity of the arguments. In the interim, R6 exhibits the capacity to differentiate between fact and opinion by analyzing the evidence and sources employed, which suggests the development of evaluative skills in academic reading.

Interview excerpts:

"Discussions broaden my perspective. I distinguish between fact and opinion based on evidence and sources." (R6)

"I am more structured in my reading. I now plan what to focus on before reading the text." (R4)

Statement R6 indicates that discussions help students broaden their perspectives in understanding texts while developing their ability to distinguish between fact and opinion based on the evidence and sources used. Meanwhile, R4 indicates an improvement in reading planning, where students become more structured and begin to determine their focus before reading a text, reflecting the development of metacognitive strategies at the planning and evaluation stages of reading. Several students also explained that they are now better able to identify main ideas more quickly and connect the text to other contexts.

"I find the main idea more quickly. I can relate the text to other contexts." (R5)

"I try to identify the author's main argument before reading the details. I highlight important points to help me remember the key ideas." (R2)

Statement R3 shows that students can locate the main concept of a text more quickly. Statement R5 shows that students can connect what they read to different situations. Both also show that pupils are starting to read with more focus and can connect what they read to what they already know or to other circumstances. This shows how comprehension tactics and information integration have changed in the digital reading process.

3.1.4 Students' metacognitive awareness prior to class

Research findings reveal that at the pre-class period, pupils' metacognitive awareness is limited to a fundamental level, classified as surface-level metacognitive awareness. Students prefer to concentrate on lexical understanding, especially via word-for-word translation methods and the pursuit of meanings for unknown words. Reflection data shows that students' reading goals at the beginning are still focused on understanding the text literally, not on understanding the ideas behind it or judging the author's argument. Some students said it was hard to put the text in their own terms, which shows that their metacognitive monitoring processes were not working well while they were reading. The findings from the interviews also back these results. Students stated that in the early stages, they read primarily to understand the basic content of the text, without actively questioning the strength of the author's argument or position. This suggests that metacognitive regulation processes at this stage are still limited to decoding and lexical comprehension.

However, the results also show that people are starting to realize that comprehension has its limits. Some pupils start to comprehend that knowing what a word means does not always entail knowing what the whole book means. This first awareness serves as a crucial basis for the subsequent development of more reflective reading practices. The first research question demonstrates that students' metacognitive awareness at the pre-class stage remains superficial, however it begins to evolve through recognition of the constraints of their own comprehension.

3.1.5 Students modify reading strategies via reflection and classroom discussion

The results in Theme 2 show that students started to change how they read by thinking about it on their own and talking about it in class. The reflection process helped students see that the tactics they used at first, including translating word for word, did not always work to help them understand the structure of academic arguments. Students' reflections demonstrated that their reading habits had changed. Students started to wonder what the author meant, what the major idea of the work was, and

how the ideas in the text were related to each other. This process shows the development of strategic awareness, which is being aware of the different ways to read the text. Discussions in class are a very important part of this process of adapting the plan. Students can compare what they know with what other people think by doing things like leading question-based discussions, presenting analytical results, and getting comments from their peers. This encounter helps students figure out what they do not comprehend. Because of this process, kids started using more advanced reading skills, including summarizing, finding the major concepts, taking notes, and asking themselves questions. These strategies show that adaptive strategy regulation is growing. This means being able to judge how well strategies are working and change them based on what the reading task need. Thus, the second research question suggests that students' adaptation of reading strategies occurs through a combination of individual reflection and social interaction in class discussions, which encourages the development of more flexible and reflective strategy regulation.

3.1.6 Students internalize regulations in critical reading

The results in Theme 3 suggest the emergence of enhanced metacognitive regulation, characterized as critical epistemic monitoring in digital reading. At this point, students read not just to understand what the text says, but also to judge the strength of the arguments, the reliability of the sources, and the author's epistemic stance. Reflection data showed that students' reasons for reading changed a lot. Students said they started reading to figure out how strong the arguments were, how to tell the difference between fact and opinion, and how to find evidence that supports the author's statements. Also, interviews showed that students become more organized in how they read. They could find main concepts faster, relate texts to bigger ideas, and come up with critical points of view during class discussions. This process shows the development of epistemic monitoring, which is the ability to judge the truth of knowledge and the quality of information in texts. Students began to grasp that academic reading is not just about understanding what the book says, but also about judging how reliable the arguments are and what they mean. Thus, the third research question indicates that the internalization of deeper regulation in critical reading occurs through the development of epistemic monitoring skills, which enable students to evaluate arguments, the credibility of information, and the position of knowledge in academic texts. Research findings indicate that the development of students' metacognitive regulation in digital reading occurs gradually through three main phases: surface-level awareness in the pre-class stage, adaptive strategy regulation through reflection and class discussion, and critical epistemic monitoring in critical reading. This method shows that teaching students how to read critically means not only helping them improve their reading skills, but also helping them understand how knowledge is generated and judged in academic literature.

3.2 Discussion

The results of this study demonstrate that the enhancement of students' metacognitive strategies in digital reading via the flipped classroom approach transpires progressively through three primary phases: initial metacognitive awareness during the pre-class stage, the adaptation of reading strategies through reflection and class discussions, and the internalization of metacognitive regulation in critical reading. These findings illustrate that academic reading in a digital context encompasses not just linguistic comprehension but also the cultivation of reflective awareness regarding the reader's cognitive processes during text interaction.

3.2.1 Surface-Level Metacognitive Awareness in the Pre-Class Stage

The research findings demonstrate that, from the outset, students' metacognitive awareness is confined to a fundamental, or superficial, level. Most students concentrate on lexical understanding, especially via word-for-word translation techniques and the pursuit of meanings for unknown words. This method shows that children still think of reading as a way to decode language, not as a more complicated way to make sense of what they read. This phenomenon corresponds with the

metacognitive theoretical framework presented by Ann L. Brown, which elucidates that novice readers primarily concentrate on linguistic elements prior to the evolution of more intricate regulating techniques. At the beginning of the flipped classroom cycle, most participants relied on basic strategies such as word-by-word translation and searching for unfamiliar vocabulary, indicating that they initially viewed reading as a decoding task rather than a meaning-construction process. When students say things like "*I cannot rephrase the text,*" it shows that they are using metacognitive monitoring, which is the ability to know how well they understand something. This awareness is an early indicator of metacognitive development, as readers begin to recognize the gap between expected and actual comprehension during reading.

Several students also said that they had trouble summarising the text or articulating how ideas were related. This shows that they were starting to use metacognitive monitoring since they could see the gaps between what they thought they understood and what they actually did. This trend could be affected by a lack of confidence, language difficulties, and a background of reading that focuses on vocabulary. Because of this, the pre-class stage was a great chance for students to address reading problems on their own and learn about the limits of surface-level solutions.

However, research findings also indicate that, although the strategies used are still simple, students begin to demonstrate an initial awareness of their limited understanding. This awareness is significant as it establishes the groundwork for the advancement of more contemplative reading practices subsequently in the course. According to self-regulation theory, when readers are aware of cognitive problems, they often look for other, better ways to understand texts. So, the pre-class period of the flipped classroom model gives students time to look at literature on their own for the first time. The tactics employed remain constrained; however, this procedure enables students to commence the identification of the difficulties encountered in reading digital academic literature.

3.2.2 Regulating Adaptive Strategies via Reflection and Classroom Discourse

The second theme shows that students changed how they read by thinking about it on their own and talking about it in class. At this point, students understood that using word-for-word translation as a first step did not always help them understand how academic writings were put together. They started identifying main ideas, questioning the author's purpose, and examining relationships among ideas. This change shows that strategic awareness has grown, meaning an increased understanding of the different ways to interpret texts. Students started to wonder about the author's intent, the text's major theme, and how the ideas in the text fit together.

This signifies a transition from literal to conceptual comprehension. This study corroborates Flavell, J. H., (1979) the assertion that metacognition comprises two primary components: awareness of cognitive methods and the capacity to manage their application. When students start to wonder what the author meant or if their techniques are working, they are learning how to regulate their own strategies (Jaiswal, 2025).

Classroom discussions play a crucial role in this strategy adaptation process. Activities such as student-based, question-based discussions, presentations of analytical results, and feedback between students create a collaborative learning environment that allows students to compare their understanding with the perspectives of others. This interaction helps students identify gaps in their understanding and improve their interpretation of the text. These findings also align with the social-constructivist perspective on learning, which emphasizes that knowledge is constructed through social interaction (Marginson & Anh, 2017). Class discussions allow students to negotiate meaning, clarify interpretations, and develop a deeper understanding of the text.

Furthermore, this study shows that some students are beginning to utilize digital technology to support their reading comprehension. The use of digital tools such as ChatGPT to identify the main idea of a text indicates that students are beginning to integrate digital learning resources as part of their reading strategies (Liao et al., 2024); (Salmerón & Delgado, 2019). This reflects the development of

digital metacognitive strategies, namely the ability of readers to utilize technology to manage their learning process. The reflection and discussion phase in the flipped classroom enhances students' comprehension of the text and fosters the ability to evaluate and adjust reading strategies flexible (Ortega-Ruipérez et al., 2024).

3.2.3 Critical Epistemic Monitoring in Digital Reading

The third motif illustrates the evolution of a more intricate metacognitive regulation, specifically critical epistemic monitoring in digital reading. (Lara Nieto-Márquez et al., 2020) assert that students no longer read solely to comprehend the text's content. Several students demonstrated more advanced forms of metacognitive regulation. They reported evaluating argument strength, comparing claims with other sources, and distinguishing fact from opinion. This suggests a shift from reading for comprehension alone toward reading for critical judgment.

Students commence to evaluate the author's arguments in relation to those of other sources, determine whether the evidence presented corroborates the author's assertions, and differentiate between fact and opinion (Marboot et al., 2020).

These strategies reflect a higher level of metacognitive regulation, as readers no longer passively process information but actively assess the reliability of the knowledge presented in the text. This development aligns with the concept of epistemic cognition, which explains that academic readers need to understand how knowledge is constructed, validated, and argued in scientific texts. When students begin to evaluate the strength of arguments or distinguish fact from opinion, they are developing an epistemic awareness of the knowledge structures within academic texts (Mehri Ghahfarokhi & Tavakoli, 2020).

Before reading the text, some students reported that they began to plan their reading focus by identifying the author's main arguments and emphasizing significant sections of the text to aid in the retention of the main ideas (Diningrat et al., 2023). This advancement illustrates the integration of the three primary components of metacognitive regulation: planning, monitoring, and evaluation. In addition to devising their reading strategies prior to reading, students also assess the quality of the information they encounter and monitor their comprehension during the reading process (Wang, 2023).

The ability to connect text content to a broader context also indicates that students are beginning to develop integrative reading strategies, namely the ability to connect information from a text to prior knowledge or other contexts. This strategy is important in academic reading because it allows readers to build a more comprehensive understanding of the topic being discussed.

3.2.4 Implications for Digital Reading and Flipped Classroom Learning

The findings of this study indicate that the development of students' metacognitive strategies in digital reading occurs through a gradual and reflective process. The flipped classroom paradigm fosters a learning environment conducive to development by integrating pre-class independent study with collaborative interactions during class discussions (Fulgueras & Bautista, 2020). The pre-class phase provides an opportunity for students to initially explore texts and recognize the difficulties they encounter in reading. The class discussion phase allows students to develop more adaptive reading strategies through reflection and social interaction. Meanwhile, the follow-up phase shows that students begin to internalize deeper metacognitive regulation in critical reading (Keskin, 2023).

The novelty of this research lies in the integration of metacognitive strategies in digital reading with the flipped classroom approach to deeply examine the process of developing students' metacognitive regulation. This research not only highlights the use of reading strategies, but also explains the stages of students' metacognitive development, starting from surface-level metacognitive awareness, adaptive strategy regulation through reflection and class discussion, to critical epistemic monitoring in critical reading. In addition, this study shows how the interaction between individual reflection, collaborative discussion, and the use of digital technology can support the development of

more reflective and critical reading strategies in the context of learning English as a foreign language. These findings provide a new contribution to understanding how the flipped classroom approach can be used to develop students' metacognitive awareness and evaluative skills in reading academic digital texts (Gok et al., 2023).

The findings of this study demonstrate that the development of students' metacognitive strategies in the Flipped Classroom context occurs gradually and is consistent with previous literature. In the initial phase, the dominance of word-for-word translation and a focus on lexical meaning indicate that students are still at the surface processing level. This condition aligns with the reading comprehension model proposed by Kintsch, (2017), which emphasizes that deep understanding requires the integration of ideas, not simply word recognition. The low level of strategic monitoring in the initial phase also confirms Flavell's view that metacognitive awareness without regulation does not automatically result in effective cognitive control. Furthermore, studies by Pardede, (2019) show that digital reading often encourages rapid and fragmented processing when not balanced with strong metacognitive strategies.

The progress occurs when classroom reflection and discussion trigger an evaluation of initial strategies. This finding was related to Kermani et al. (2023) Shih & Huang, (2020). which asserts that flipped classrooms combined with explicit strategy instruction can enhance the use of metacognitive strategies in EFL reading. Consistent with Bergmann & Sams, (2014); Davis,(2013),the effectiveness of flipped classrooms lies in utilizing class time for analytical activities, rather than transmitting basic material. In addition, this study lends support to the findings of Ramadhanti et al. (2026); Wang, 2023) state that flipped classrooms have the potential to improve students' ability to self-regulate their learning when they actively reflect on the tactics they use to learn.

This result discusses a potential developmental sequence of metacognitive strategy utilization in digital reading, progressing from surface-level decoding, to adaptive regulation, to critical evaluation. The study emphasizes that strategy development can occur from the relationship of individual reading, collaborative debate, and digital technologies, rather than concentrating only on successful academic outcomes.

Regarding the interpretation of the findings, it is important to take into account the fact that this study contains a number of limitations. The first limitation is that the results cannot be generalized to a wider range of learning environments because there were only a very small number of participants. Second, the research was conducted on a single class that was comprised of students from a single educational establishment; hence, the results may be influenced by the peculiarities of that particular learning environment. In addition, the majority of the data for the study was collected through written reflections and interviews, both of which are dependent on the students' capacity to vocally explain their metacognitive experiences. Therefore, it is advised that future studies use additional data gathering methods such as observations of digital reading processes or analysis of learning activities on online learning platforms. Additionally, it is recommended that a larger number of participants be involved, as well as a wider variety of institutional contexts.

4. CONCLUSION

This study shows how independent pre-class reading, reflective tasks, and collaborative classroom discussion can help students acquire metacognitive awareness in digital reading in a flipped classroom. The findings emphasise the necessity of helping students set reading goals, monitor comprehension, and critically evaluate arguments and evidence. Flipped learning can help EFL teachers create more active reading environments by mixing digital texts with organised reflection prompts, peer discussion, and feedback activities that improve comprehension and critical thinking.

There are several limitations. First, the sample size was small, involving only seven participants. Second, the research was conducted in one institution, which may limit transferability to other contexts. Third, the study was implemented over a short duration of three sessions, so long-term development

of metacognitive strategies could not be fully examined. Future research should investigate how the incorporation of additional digital technologies, such as adaptive learning platforms or digital annotation tools, can enhance students' development of metacognitive strategies while reading digital texts in a flipped classroom environment. Additionally, longitudinal studies with a more extensive and diverse sample are required to enhance the understanding of the internalization process of metacognitive regulation and its influence on critical digital reading skills in EFL education.

REFERENCES

- Adnan, M. (2017). Perceptions of senior-year ELT students for flipped classroom: A materials development course. *Computer Assisted Language Learning*, 30(3–4), 204–222. <https://doi.org/10.1080/09588221.2017.1301958>
- Ahangari, S., & Mohseni, F. (2016). *The Effect of Awareness Raising Through Metacognitive Strategy-based Instruction on ESP Learners' Reading Comprehension*. 9(18).
- Akhiruddin, A., Amir, A., . S., . R., . S., . J., Salemuddin, Muh. R., . S., & Iskandar, Abd. M. (2023). Developing Digital Sociology Module Based Multicultural for Students' Learning Outcomes Improvement. *KnE Social Sciences*. <https://doi.org/10.18502/kss.v8i18.14303>
- Asdar, A., Hamsiah, A., Sujarwo, S., Lutfin, N., & Sukmawati, S. (2024). Integrative approach for reading comprehension espousing information communication technology literacy. *International Journal of Evaluation and Research in Education (IJERE)*, 13(6), 4384. <https://doi.org/10.11591/ijere.v13i6.29461>
- Bergmann, J., & Sams, A. (2014). *Flipped learning: Gateway to student engagement*. International Society for Technology in Education 1st ed.
- Braun, V., & Clarke, V. (2022). *Thematic Analysis*. SAGE.
- Buskes, G., Balendhran, S., & Xavier, M. S. (2025). *Planning, Monitoring, Evaluating: Providing students with a structured approach to solving electrical circuit problems*.
- Creswell, J. W., & Creswell, J. D. (2023). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*.
- Crouch, C. H., Watkins, J., Fagen, A. P., & Mazur, E. (2007). Peer Instruction: Engaging Students One-on-One, All At Once. *Reviews in Physics Education Research*, 1(1), 1–55. <https://doi.org/10.1119/RevPERv1.1.3>
- Davis, C. (2013). *Flipped or Inverted Learning: Strategies for Course Design*. IGI Global Scientific Publishing. <https://doi.org/10.4018/978-1-4666-3962-1.ch017>
- Dewi, R. C., Yanti, P. G., & Tarmini, W. (2025). The Impact of the Integration of Metacognitive Strategy in the Flipped Classroom Model on Vocational High School Students' Writing Skill, Writing Anxiety, and Writing Self-Efficacy. *International Journal of Learning, Teaching and Educational Research*, 24(2), 133–152. <https://doi.org/10.26803/ijlter.24.2.7>
- Diningrat, S. W. M., Setyosari, P., Ulfa, S., & Widiati, U. (2023). The Effect of an Extended Flipped Classroom Model for Fully Online Learning and its interaction with Working Memory Capacity on Students' Reading Comprehension. *Journal of New Approaches in Educational Research*, 12(1), 77–99. <https://doi.org/10.7821/naer.2023.1.1073>
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist*, 34(10), 906. <https://doi.org/https://doi.org/10.1037/0003-066X.34.10.906s>
- Fulgueras, M. J., & Bautista, J. (2020). Flipped Classroom: Its Effects on ESL Learners' Critical Thinking and Reading Comprehension Levels. *International Journal of Language and Literary Studies*, 2(3), 257–270. <https://doi.org/10.36892/ijlls.v2i3.228>
- GiRgiN, P., & Cabaroğlu, N. (2021). Web 2.0 Supported Flipped Learning Model: EFL Students' Perceptions and Motivation. *Cukurova University Faculty of Education Journal*, 50(2), 858–876. <https://doi.org/10.14812/cuefd.944217>

- Gok, D., Bozoglan, H., & Bozoglan, B. (2023). Effects of online flipped classroom on foreign language classroom anxiety and reading anxiety. *Computer Assisted Language Learning*, 36(4), 840–860. <https://doi.org/10.1080/09588221.2021.1950191>
- Hajhashemi, K., Caltabiano, N., & Anderson, N. (2017). Integrating digital technologies in the classroom: Lecturers' views on the flipped classroom approach. *Australian and International Journal of Rural Education*, 26(3), 18–29. <https://doi.org/10.47381/aijre.v26i3.74>
- Hava, K. (2024a). A Systematic Review of Flipped Learning in EFL Education. *Malaysian Online Journal of Educational Technology*, 12(4), 175–188. <https://doi.org/10.52380/mojet.2024.12.4.556>
- Hava, K. (2024b). A Systematic Review of Flipped Learning in EFL Education. *Malaysian Online Journal of Educational Technology*, 12(4), 175–188. <https://doi.org/10.52380/mojet.2024.12.4.556>
- Henderson, W., Plattner, L., Baucum, B., Casey, T., Grant, A., & Headlee, P. (2020). Student Involvement in Flipped Classroom Course Design. *Journal of Occupational Therapy Education*, 4(3). <https://doi.org/10.26681/jote.2020.040311>
- Jaiswal, P. (2025a). Cognitive, Metacognitive, and Digital Reading Strategies in English Education: A 20-Year Review. *International Journal of Linguistics, Literature and Translation*, 8(9), 10–18. <https://doi.org/DOI:%2010.32996/ijllt.2025.8.9.2>
- Jaiswal, P. (2025b). Cognitive, metacognitive, and digital reading strategies in english education: A 20-year review. *International Journal of Linguistics, Literature and Translation*. <https://doi.org/DOI:%2010.32996/ijllt>
- Kermani, Z. S. H., Rad, N. F., & Jalali, V. (2023). Metacognitive Knowledge Raising Via Explicit Reading Strategy Instruction in Flipped Instructional Environment: A Mixed-Method Study Focusing on EFL Learners Reading Skill Development. *International Journal of Knowledge Processing Studies*, 3(3). <https://doi.org/10.22034/kps.2023.370445.1074>
- Keskin, D. (2023). Implementation of flipped model in EFL reading classrooms. *Turkish Online Journal of Distance Education-TOJDE*, 24(3), 261–279. <https://doi.org/https://doi.org/10.17718/tojde.1132888>
- Khaerani, P., & Nahartini, D. (2025). *The Effectiveness of Using Flipped Reading Method to Enhance Students' Reading Comprehension*. 13(2).
- Khodaei, S., Hasanvand, S., Gholami, M., Mokhayeri, Y., & Amini, M. (2022). The effect of the online flipped classroom on self-directed learning readiness and metacognitive awareness in nursing students during the COVID-19 pandemic. *BMC Nursing*, 21(1), 22. <https://doi.org/10.1186/s12912-022-00804-6>
- Kintsch, W. (2017). *Psychological models of reading comprehension and their implications for assessment*. Rowman & Littlefield Education.
- Koh, J. H. L. (2019). Four Pedagogical Dimensions for Understanding Flipped Classroom Practices in Higher Education: A Systematic Review. *Educational Sciences: Theory & Practice*, 19(4), 14–33. <https://doi.org/10.12738/estp.2019.4.002>
- Lara Nieto-Márquez, N., Baldominos, A., & Pérez-Nieto, M. Á. (2020). Digital Teaching Materials and Their Relationship with the Metacognitive Skills of Students in Primary Education. *Education Sciences*, 10(4), 113. <https://doi.org/10.3390/educsci10040113>
- Liao, J., Zhong, L., Zhe, L., Xu, H., Liu, M., & Xie, T. (2024). Scaffolding Computational Thinking With ChatGPT. *IEEE TRANSACTIONS ON LEARNING TECHNOLOGIES*, 17, 1628–1642. <https://doi.org/https://ieeexplore.ieee.org/abstract/document/10508087/>
- Lim, F. V., & Toh, W. (2020). How to teach digital reading? *Journal of Information Literacy*, 14(2). <https://doi.org/10.11645/14.2.2701>
- Limbong, S., Nursyam, Asdar, Palayukan, N., & Tandibura, F. (2024). Synchronous Online Reading toward Digital Literacy and Higher-Order Thinking Skills Supporting Cadets' Self-Regulated Learning. *XLinguae*, 17(4), 317–335. <https://doi.org/10.18355/XL.2024.17.04.19>

- Marboot, K., Roohani, A., & Mirzaei, A. (2020). Investigating Iranian EFL Students' Metacognitive Online Reading Strategies, Critical Thinking, and Their Relationship: A Mixed-Methods Study. *Issues in Language Teaching*, 9(1). <https://doi.org/10.22054/ilt.2020.50833.475>
- Marginson, S., & Anh, D. T. K. (2017). Vygotsky's Sociocultural Theory in the Context of Globalisation. *Asia Pacific Journal of Education*, 37(1), 116–129.
- Mehri Ghahfarokhi, M., & Tavakoli, M. (2020). The Effect of Technology-mediated Reading Comprehension Tasks on Autonomy and Metacognitive Strategy Use by Iranian EFL Intermediate Learners. *Journal of Modern Research in English Language Studies*, 7(3). <https://doi.org/10.30479/jmrels.2020.11739.1459>
- Novak, G. M. (2011). Just-in-time teaching. *New Directions for Teaching and Learning*, 2011(128), 63–73. <https://doi.org/10.1002/tl.469>
- Ortega-Ruipérez, B., Pereles López, A., & Lázaro, M. (2024). Impact of a Digital Tool to Improve Metacognitive Strategies for Self-Regulation During Text Reading in Online Teacher Education. *Journal of Information Technology Education: Innovations in Practice*, 23, 007. <https://doi.org/10.28945/5305>
- Oxford, R. L. (2011). *Teaching and researching language learning strategies*. Teaching and researching language learning strategies.
- Pahrizal, N., Vintoni, A., Sotlikova, R., & Ya'akub, H. Z. H. (2025). Metacognitive Reading Strategies and Their Impact on Comprehension: Insights from Rural EFL Learners. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 18–36. <https://doi.org/10.23917/ijolae.v7i1.23908>
- Pardede, P. (2019). Print vs Digital Reading Comprehension in EFL: A Literature Review. *JET (Journal of English Teaching)*, 5(2), 77. <https://doi.org/10.33541/jet.v5i2.1059>
- Ramadhanti, D., Yanda, D. P., & Nofriadi, R. (2026). Students' metacognition growth in reading: The effectiveness of flipped metacognitive strategy. *International Journal of Evaluation and Research in Education (IJERE)*, 15(1). <https://doi.org/10.11591/ijere.v15i1.26824>
- Reiber-Kuijpers, M., Kral, M., & Meijer, P. (2021). Digital reading in a second or foreign language: A systematic literature review. *Computers & Education*, 163, 104115. <https://doi.org/10.1016/j.compedu.2020.104115>
- Rinantanti, Y., Ibrahim, M., Sujarwo, S., Nemo, M. L., & Wally, A. R. (2025). An Analysis of the Development of EFL Students' Communicative Competence Based on Technological Knowledge in Higher Education. *AL-TA'LIM JOURNAL*, 32(3), 306–318. <https://doi.org/DOI:%2010.15548/jt.v32i3.%20895>
- Salmerón, L., & Delgado, P. (2019). Critical analysis of the effects of the digital technologies on reading and learning / Análisis crítico sobre los efectos de las tecnologías digitales en la lectura y el aprendizaje. *Cultura y Educación*, 31(3), 465–480. <https://doi.org/10.1080/11356405.2019.1630958>
- Samangun, K., & Rosmayanti, V. (2024). The Effect of Jigsaw Method on Students' Reading Comprehension at Junior High School Students. *Education, Language, and Culture (EDULEC)*, 4(1). <https://doi.org/DOI:%20https://doi.org/10.56314/edulec.v4i1>
- Samiei, F., & Ebadi, S. (2021). Exploring EFL learners' inferential reading comprehension skills through a flipped classroom. *Research and Practice in Technology Enhanced Learning*, 16(1), 12. <https://doi.org/10.1186/s41039-021-00157-9>
- Saqr, A. K. (2021). The effect of digital reading on efl learners' reading comprehension. *International Journal of Education, Technology and Science*, 1(1).
- Sari, M. I. (2016). Cognitive and Metacognitive Reading Strategy Use and Reading Comprehension Performance of Indonesian EFL Pre-service Teachers. *Journal of Foreign Language Teaching and Learning*, 1(2). <https://doi.org/10.18196/ftl.1213>
- Sasabone, L., Yuriatson Jubhari, Nursyam, Asdar, Kaharto, & Khaliq Bashar. (2023). The effectiveness of Authentic Materials For Reading Comprehension of English for Specific Purposes (ESP) Students. *IJOLEH: International Journal of Education and Humanities*, 2(2), 125–134. <https://doi.org/10.56314/ijoleh.v2i2.173>

- Sezgin, Z. Ç. (2022). Systematic analysis of digital reading studies in the digital age. *Participatory Educational Research*, 9(1), 233–250. <https://doi.org/10.17275/per.22.13.9.1>
- Shih, H. J., & Huang, S. C. (2020). College students' metacognitive strategy use in an EFL flipped classroom. *Computer Assisted Language Learning*, 33(7), 755–784. <https://doi.org/10.1080/09588221.2019.1590420>
- Suhartini, S., & Ulfa, S. M. (2024). Students' perception of digital texts reading: A case study at the english education department of STKIP PGRI bangkalan. *ELTR Journal*, 8(2), 144–154. <https://doi.org/10.37147/eltr.v8i2.184>
- Sujarwo, Asdar, Asdam, M., Syam, N. I., & Limbong, S. (2026). Fostering Digital Critical Thinking within the Integrated Approach. *XLinguae*, 19(4), 603. https://doi.org/https://www.xlinguae.eu/2026_19_1_1.htm
- Sukmawati, S., Syam, N. I. S., Jubhari, Y. J., Mardiani, M., Sasabone, L., & Sujarwo, S. (2023). Implementation of Technology on English for Specific Purposes (ESP) Students in Communicative Language Teaching Approach. *Ethical Lingua: Journal of Language Teaching and Literature*, 10(1). <https://doi.org/10.30605/25409190.566>
- Sutiyatno, S., & Sukarno, S. (2019). A Survey Study: The Correlation between Metacognitive Strategies and Reading Achievement. *Theory and Practice in Language Studies*, 9(4), 438. <https://doi.org/10.17507/tpls.0904.11>
- Wahid, A., Afni, N., & Sujarwo, S. (2025). Promoting Learners' Autonomy through Metacognitive, Higher-Order Thinking Skills and Digital Literacy of Indonesian Private Universities. *Educational Process International Journal*, 16(1). <https://doi.org/10.22521/edupij.2025.16.204>
- Wang, Y. (2023a). Enhancing English reading skills and self-regulated learning through online collaborative flipped classroom: A comparative study. *Frontiers in Psychology*, 14, 1255389. <https://doi.org/10.3389/fpsyg.2023.1255389>
- Wang, Y. (2023b). Enhancing English Reading Skills and Self-Regulated Learning Through Online Collaborative Flipped Classroom: A Comparative Study. *Frontiers in Psychology*, 14, 1255389. <https://doi.org/10.3389/fpsyg.2023.1255389>
- Yulian, R. (2021). The flipped classroom: Improving critical thinking for critical reading of EFL learners in higher education. *Studies in English Language and Education*, 8(2), 508–522. <https://doi.org/10.24815/siele.v8i2.18366>
- Zarouk, M. Y., Olivera, E., Peres, P., & Khaldi, M. (2020). The Impact of Flipped Project-Based Learning on Self-Regulation in Higher Education. *International Journal of Emerging Technologies in Learning (iJET)*, 15(17), 127. <https://doi.org/10.3991/ijet.v15i17.14135>