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Higher-order thinking skills (HOTS) in reading comprehension of EFL class

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ABSTRACT

Higher Order Thinking Skills (HOTS) have become a crucial focus in EFL classrooms, especially in reading comprehension, as they support learners in developing critical, analytical, and reflective skills. This study aimed to explore students' perceptions of HOTS implementation in reading activities and assess their HOTS-based reading comprehension abilities. This qualitative descriptive involved one EFL class at Riau Kepulauan University who had completed the Extensive Reading course. Data collection employed a questionnaire assessing four HOTS indicators, such as creative thinking, critical thinking, problem solving, and decision making, and a reading comprehension test focusing on three HOTS components, consist of critical thinking, transfer, and problem solving. The results showed that most students had positive perceptions, with dominant responses falling into "Agree" and "Neutral" categories across all indicators. In the reading test, the majority of students demonstrated strong performance, 65–88% showed high-level critical thinking, 81–85% performed well in transfer tasks, and 73–77% successfully solved problems by designing logical endings and action plans. These findings suggest that integrating HOTS into reading instruction fosters cognitive growth and engagement. It is therefore recommended that educators incorporate HOTS-based strategies more systematically, providing structured activities and continuous support to enhance students' higher-order thinking in EFL reading contexts.

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INTRODUCTION

In today's globalized world, English functions as a vital tool in education, diplomacy, and technology. As a global lingua franca, English proficiency is crucial for academic success and access to international opportunities (Crystal, 2003). In Indonesia, the strategic role of English as a Foreign Language (EFL) is evident in its inclusion as a compulsory subject in schools, aiming to prepare students for global communication and competitiveness. However, teaching English in EFL contexts should transcend grammar and vocabulary drills, it must develop learners' capacity to think critically, creatively, and reflectively. This shift reflects the demands of 21st-century education, where language learning is intertwined with cognitive development (Zhang, 2022). Among the four core language skills, reading holds a central role in EFL learning. Reading allows learners to access information, expand vocabulary, and comprehend diverse genres and academic discourse (Grabe & Stoller, 2019). In academic contexts, reading skills underpin success across disciplines, especially when learners engage with authentic texts. However, traditional reading instruction often emphasizes lower-order thinking skills (LOTS), such as recalling facts and identifying main ideas (Indriyana & Kuswandono, 2019). This approach limits learners' potential to engage deeply with texts, thereby hindering their intellectual development.

Education in the 21st century places strong emphasis on developing Higher Order Thinking Skills (HOTS) to equip students with the essential abilities needed to navigate a world that is increasingly complex and ever-changing. In a time marked by rapid technological progress, overwhelming access to information, and frequent cross-cultural exchanges, the capacity to think critically, solve problems creatively, and assess information thoughtfully has become more important than ever. HOTS includes key cognitive processes such as analyzing, evaluating, synthesizing, and creating, skills that enable learners to engage with information in a reflective, innovative, and independent way (Brookhart, 2011). These abilities not only enhance students' academic performance but also prepare them to respond thoughtfully to real-world challenges. In the context of reading, HOTS helps learners go beyond basic understanding by interpreting deeper meanings, evaluating the reliability and relevance of ideas, questioning assumptions, and linking what they read to their existing knowledge and personal experiences (Grabe & Stoller, 2019). Engaging students in higher-order reading activities cultivates intellectual curiosity, fosters autonomy in learning, and sharpens their ability to interpret and evaluate texts at a deeper level. As such, incorporating HOTS into reading instruction marks a fundamental shift away from traditional memorization-focused teaching toward more student-centered and inquiry-based educational approaches (Renandya, 2021).

Higher Order Thinking Skills (HOTS) encompass a variety of advanced cognitive functions, including critical analysis, creativity, and evaluative reasoning. Instead of

simply recalling or reproducing information, individuals with well-developed HOTS are able to apply their knowledge in novel situations, assess information from multiple viewpoints, make thoughtful decisions, and generate original solutions or ideas. Despite its recognized importance, HOTS remains insufficiently represented in reading materials, particularly in comprehension activities, a concern highlighted by recent research (Erdiana & Panjaitan, 2023). Within EFL classrooms, HOTS plays a crucial role in nurturing students' ability to think analytically, adopt alternative perspectives, and exercise creativity, all of which are key components of critical thinking and problem-solving (Sani, 2019). The central aim of HOTS is to enhance students' cognitive engagement, specifically their ability to think critically and creatively when encountering diverse types of information (Lusi et al., 2019). Integrating HOTS into EFL instruction not only improves students' understanding of texts but also fosters deeper, more reflective thinking about what they read. This approach supports the idea that HOTS allows learners to connect prior knowledge to new contexts, paving the way for innovative problem-solving. Through the cultivation of HOTS, students are encouraged to analyze situations, tackle problems, and develop original ideas or products. Ultimately, HOTS equips learners to make well-reasoned decisions grounded in advanced thinking processes and strengthens their confidence in their own intellectual abilities.

Reading activities are very important in improving the quality of human resources. Reading activities can be seen as basic activities to obtain the knowledge needed by humans to achieve progress in life. Reading is a sine quo nonactivity in the entire educational process. All fields, whether related to science or culture, do not require reading activities (Rizal, 2018). Reading is one part of language skills, in addition to listening, speaking, and writing skills. These four skills are basically language skills that are interrelated with each other. The first two language skills namely reading skills and listening skills are grouped into the receptive skills section, while the second skills namely speaking and writing skills are grouped into productive skills. Reading skills as receptive skills play a very important role, this is because learning activities require students and teachers to read a lot to be able to gain knowledge (Rizal, 2018). The knowledge gained through reading activities can be conveyed to others through productive activities, namely through writing and speaking skills. Therefore, without reading activities, it is very difficult to convey ideas or thoughts through writing activities. Reading serves not only as a tool for acquiring language but also as a medium for communication and the exchange of ideas and knowledge (Nurdiana & Amelia, 2015). At its core, the purpose of reading is to establish connections between what learners already know and the new information they encounter. Reading is one of the essential skills in language learning and plays a vital role in developing students' overall language proficiency. In the context of EFL in Indonesia, reading is a compulsory subject for college-level learners; however, many students still struggle to comprehend texts effectively, despite having learned English for several years (Wilany

& Dewi, 2017). This persistent difficulty highlights the need for more effective instructional strategies that not only address linguistic barriers but also enhance students' cognitive engagement with texts.

Reading comprehension involves exploring and constructing meaning through active engagement with written text. This comprehension can be seen as the brain's cognitive ability to interpret meaning and explore the social context embedded in a text (Silalahi et al., 2022). To achieve robust comprehension, readers must critically evaluate and analyze what they read. Furthermore, reading comprehension is a dynamic and iterative process in which understanding deepens as readers engage more deeply with the material. Effective readers construct mental representations of the text and continually revise these models as they encounter new details. They also use metacognitive strategies, such as self-questioning and evaluating their understanding of the material, to successfully navigate complex academic texts (Hamma et al., 2023). According to (Grabe, 2009), reading is both a comprehension process and a linguistic process, in which readers actively construct meaning based on the interaction between prior knowledge, text structure, and linguistic cues. For college students, advanced comprehension skills are essential for mastering complex theoretical ideas, critically engaging with scholarly work, and producing sophisticated academic writing. In higher education, reading involves more than just basic comprehension. Reading requires the ability to analyze, synthesize information from multiple sources, and construct arguments based on evidence.

Education systems worldwide emphasize the integration of Higher Order Thinking Skills (HOTS) into instruction. According to (Wilson, 2001) revision of Bloom's Taxonomy, HOTS comprises analyzing, evaluating, and creating, skills that demand learners to interpret, critique, and produce knowledge rather than merely consume it. In reading comprehension, HOTS enables students to draw inferences, evaluate arguments, synthesize information across sources, and generate new ideas (Weaver & Constance, 2002). The integration of HOTS in lesson planning allows students to move beyond rote memorization and encourages them to interpret, analyze, and evaluate information in more meaningful ways (Putri & Sulistyaningrum, 2021). (Putri & Sulistyaningrum, 2021) also stated that lesson plans that integrate HOTS stimulate students to think critically through tasks that require them to compare perspectives and construct arguments based on reading materials.

Although the importance of Higher Order Thinking Skills (HOTS) is widely acknowledged, its application in English as a foreign language (EFL) classrooms remains far from optimal. While educational policies and curriculum guidelines increasingly stress the cultivation of critical and analytical abilities, the enhancement of EFL students' higher-order thinking in reading is still not a primary concern in many teaching practices (Indriyana & Kuswandono, 2019). In numerous EFL contexts, reading exercises tend to focus on lower-level comprehension tasks, such as recalling

details, identifying main ideas, and responding to factual questions, activities that fall short of engaging students in deeper cognitive processes.

Several obstacles hinder the effective incorporation of HOTS into EFL instruction. A key issue is the lack of sufficient professional development programs specifically aimed at equipping teachers with the skills to nurture higher-order thinking through reading activities (Silalahi et al., 2022). The purpose of this development program is to not only offer a theoretical understanding of HOTS but also provide practical classroom-based training, ongoing mentoring, and opportunities for reflective practice to ensure long-term pedagogical transformation. Without such a targeted initiative, teachers may struggle to move beyond basic comprehension questions and fail to integrate higher-order cognitive tasks essential to developing critical readers in EFL contexts. Many educators have not undergone systematic training on how to design and implement tasks that stimulate analysis, synthesis, evaluation, and creative problem-solving.

Several previous studies have examined the role of HOTS in language education, particularly in EFL contexts. (Indriyana & Kuswandono, 2019) emphasized how English teachers often rely on lower-order comprehension tasks, limiting the development of critical and analytical abilities. Similarly, (Damaianti et al., 2020) underscored the lack of literacy assessment tools in Indonesia that specifically target HOTS competencies, making it difficult for educators to measure students' higher-level understanding. Meanwhile, (Erdiana & Panjaitan, 2023) found that English teaching tools used in Indonesian EFL class only partially integrate HOTS elements, which suggests a gap between policy expectations and classroom implementation.

This study offers a more focused contribution by examining EFL students' actual perceptions and performance in HOTS-based reading comprehension tasks, especially through the activity of creating new story endings. This specific angle allows for a deeper exploration of how HOTS can be fostered and assessed meaningfully in real classroom settings. In their quasi-experimental study, (Nurmaharaeni et al., 2022) found that students who were treated through HOTS-based learning strategies showed a 32% increase in reading ability scores compared to the control group. This proves that the integration of HOTS in reading activities can significantly improve the quality of students' understanding, both in terms of inference, assessment, and information synthesis.

Although many educators recognize the importance of Higher Order Thinking Skills (HOTS) in enhancing academic rigor and promoting intellectual independence, they often face substantial challenges when trying to implement these skills in practice. (Utami et al., 2021) observed that many educators lack adequate training and resources to foster HOTS. Similarly, (Ansori, 2019) noted that the effectiveness of English teachers in applying HOTS-oriented techniques is largely influenced by their

pedagogical readiness and the availability of instructional support. Without sufficient training and pedagogical support, teachers often fall back on traditional comprehension exercises that emphasize lower-order cognitive tasks, like identifying main ideas and recalling details, rather than promoting deeper intellectual engagement. Several effective strategies have been identified to nurture HOTS in the context of reading instruction. For example, mind mapping enables students to visually organize and display the relationships between key concepts in a text, encouraging synthesis and deeper comprehension. Another highly effective approach is text-based debate, where students critically examine different viewpoints, construct and defend arguments, and challenge ideas using textual evidence. This method not only sharpens critical thinking but also strengthens students' communication skills and cognitive flexibility. Additionally, writing text reviews offers learners the opportunity to critically assess narrative structure, authorial purpose, thematic elements, and stylistic techniques, thereby enhancing evaluative and reflective thinking. By deliberately incorporating strategies such as mind mapping, text-based debates, and text reviews (Joanna & Setyawan, 2023).

Several activities can improve HOTS skills in students in EFL classes, namely brainstorming, exploiting pictures, creating new endings for a story, debate, and project into reading comprehension activities, teachers can establish more intellectually demanding classrooms that support the development of students' higher-order thinking abilities (Renandya, 2021). These instructional practices not only contribute to academic achievement but also help prepare students with the critical reasoning and problem-solving skills necessary to navigate the complexities of their future academic, professional, and personal lives. Brainstorming invites students to generate as many ideas as possible on a given topic without worrying about making mistakes. The emphasis is initially on producing a large number of ideas, with the quality and relevance assessed later. This activity helps sharpen skills such as idea fluency, divergent thinking, and evaluative thinking. The next activity, exploiting pictures, encourages students to go beyond merely recognizing objects in an image; they are prompted to analyze, infer meanings, interpret emotions, and even build stories around the pictures. This promotes analytical thinking, inference, and creative storytelling. Creating new endings for a story is another powerful activity that challenges students to evaluate the plot, imagine alternative outcomes, and craft logical or unexpected conclusions, fostering imagination, creativity, and logical reasoning. Debates require students to research topics, build solid arguments, anticipate opposing viewpoints, and defend their positions with respect and persuasiveness. Through debates, students develop argumentative analysis, critical evaluation, and persuasive communication skills. Finally, projects provide a rich context for practicing HOTS by requiring teamwork, research, creativity, and problem-solving to produce a concrete outcome. These tasks involve integrating analysis, evaluation, and creation, while also promoting collaboration and independent

learning. Although teaching HOTS can be demanding, embedding them into daily lessons is incredibly worthwhile. To effectively foster HOTS, teachers should make them a routine part of their teaching practice, model critical thinking, and consistently encourage students to engage in higher-order thinking. While this process takes time and ongoing support, the long-term gains for students make it a highly rewarding effort.

Despite the growing emphasis on Higher Order Thinking Skills (HOTS) in national curriculum frameworks and educational policy, their practical application in EFL reading instruction remains suboptimal. Previous studies have mostly focused on textbook analysis (Maryamah et al., 2024) & (Erdiana & Panjaitan, 2023), teacher strategies (Indriyana & Kuswandono, 2019), or the impact of HOTS on general learning outcomes (Nurmaharaeni et al., 2022). These studies often reveal a misalignment between policy mandates and classroom practices, with reading tasks still dominated by lower-order thinking questions and a lack of sufficient training for teachers to design and implement HOTS-based instruction effectively (Silalahi et al., 2022) & (Utami et al., 2021). The present study aims to fill this gap by investigating students' perceptions and assessing their HOTS-based reading performance through the lens of critical thinking, knowledge transfer, and problem solving, specifically using creative narrative reconstruction as a practical evaluation task. By doing so, this study not only contributes original insight into HOTS integration in EFL contexts but also offers an instructional model that can be replicated to enhance cognitive engagement in reading.

This study offers a significant contribution compared to previous research, as it specifically investigates the implementation of Higher Order Thinking Skills (HOTS) in the reading comprehension of EFL students. While most prior studies have focused merely on the general effectiveness of HOTS in learning or have explored higher-order thinking as an isolated skill, this research aims to examine students' perceptions and assess their HOTS abilities in depth, particularly through a creating new endings activity. This activity was intentionally selected because it aligns with the instruments used in the study, namely a reading test and a questionnaire designed to explore students' perceptions. Therefore, this research provides an original contribution by offering insights into how HOTS can be measured and understood in the context of EFL students' reading comprehension.

This study contributes to the development of research on the application of Higher Order Thinking Skills (HOTS) in English language learning, particularly in enhancing the reading comprehension skills of EFL students. Furthermore, the findings of this study can serve as a valuable reference for other researchers interested in exploring similar topics. In addition, the study offers practical benefits for teachers by providing insights into HOTS-based instructional strategies that can help improve students' reading abilities, especially through the creating new endings activity. For students,

the study helps foster critical, creative, and reflective thinking skills in understanding English texts, particularly within the EFL classroom context.

RESEARCH METHODOLOGY

Research Design

A qualitative approach was chosen due to its capacity to explore complex educational phenomena in depth, prioritizing detailed understanding over generalization. It is particularly effective in capturing participants' subjective experiences, interpretations, and perceptions of specific social contexts (Herman et al., 2022). This study employed a descriptive qualitative research design. This study aimed to explore students' perceptions of HOTS implementation in reading activities and to assess their HOTS-based reading comprehension abilities. A qualitative descriptive approach was selected because it is suitable for providing straightforward descriptions of participants' experiences and educational practices without extensive abstraction or theoretical interpretation (Sandelowski, 2000). Unlike quantitative methods that aim for broad generalizability, qualitative research provides rich, contextual insights into individual behaviors, attitudes, and lived experiences (Creswell, 2018). Consistent with qualitative research principles, data are analyzed and presented in a descriptive, narrative format, organized thematically to reflect emerging patterns, connections, and interpretations drawn from the dataset. While the emphasis remains on qualitative insight, the study incorporates limited quantitative elements, numerical data from tools like rating scales and tests are converted into percentages and describes the results of the data to illustrate the distribution or frequency of observed variables. These figures are not intended for statistical inference but serve to complement and support the qualitative findings, offering an accessible overview of trends among participants. By blending in-depth qualitative descriptive with basic quantitative descriptions, this research provides a nuanced and balanced portrayal of HOTS implementation in EFL reading instruction. The chosen methodology ensures that the findings are contextually rich and analytically sound, offering practical and theoretical insights for educators, researchers, and policymakers striving to foster critical thinking in language education.

Research Subject

This research was conducted at Riau Kepulauan University especially in majoring in English Education, the researcher chose one EFL class that had completed extensive reading learning. They were chosen as the subject because the criteria were analyzed relates HOTS students' achievement in reading comprehension especially in creating new endings for a story activity.

Instruments

In collecting data, this study utilized two primary methods: a reading comprehension test for assessing students' reading comprehension of HOTS and a questionnaire to know the students' perception about HOTS. The researcher employed a questionnaire structured around the original Likert scale, which presents a series of statements related to real-world phenomena, asking participants to indicate their level of agreement (Herman et al., 2022).

Data Collection Procedure

A questionnaire serves as an instrument for gathering responses to a set of systematically arranged questions, typically completed by respondents through a printed or digital form. For this study, Google Forms was used to design and distribute the online questionnaire, allowing customization of questions to suit the research objectives. The questionnaire aimed to explore students' perceptions and enhance their HOTS abilities in reading comprehension within the EFL classroom. It comprised closed-ended questions that primarily sought to capture participants' opinions. The initial section collected demographic details such as gender, name, class, and WhatsApp number. In the subsequent section, a five-point Likert scale was used, where responses were rated as follows (5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree). The indicators for each statement in the questionnaire consist of creative thinking aspects, critical thinking aspects, problem-solving aspects, and decision making aspects. (Witdianti, 2023). To assess the validity of students' perceptions of HOTS, the researcher conducted item validity analysis using the Pearson product-moment correlation formula.

The second procedure employed by the researcher was a test designed to assess the variable under study. A test functions to evaluate and measure an individual's quality, knowledge, and skills. Data were collected through a reading comprehension assessment conducted in the form of a new endings test. To assess students' reading comprehension, the researcher administered a reading test based on creating new endings to a text in the form of a narrative text. The test was given to students after the instrument's validity had been verified, as ensuring validity is essential to obtaining a reliable and accurate instrument. The type of validity used was content validity, as the instrument was structured in the form of a reading test. Content validity is aimed at assessing learning outcomes. Content validity refers to an instrument, in the form of a test, that is used to evaluate academic achievement as well as the effectiveness of program implementation and the attainment of learning objectives (Sugiyono, 2019). Researchers use content validity by analyzing the Semester Learning Plan of the lecturer in charge of the Extensive Reading course so that researchers can analyze the questions that will be created and adjust the questions with the assessment rubric

adopted from (Brookhart, 2011) and the assessment categories adopted from (Akib & Ghafar, 2015).

Data Analysis Technique

This study employed a descriptive qualitative approach, with the data analyzed thematically and descriptively. The study aimed to explore students' perceptions regarding the implementation of Higher Order Thinking Skills (HOTS) in reading comprehension, as well as to assess their performance in reading tasks. The researcher utilized descriptive analysis techniques to interpret data collected through questionnaires and reading comprehension tests.

To facilitate analysis, the data were tabulated to calculate the percentage distribution of students' responses from the questionnaire and their scores from the reading test. This allowed the researcher to identify students' perceptions and measure their competencies related to HOTS in reading comprehension within the EFL context. Furthermore, the data were categorized and interpreted based on relevant indicators, with each category described qualitatively according to students' performance and perception patterns.

RESULTS

Based on the results of the research analysis shown in the table of questionnaire data collection results below, it can be seen that several HOTS stages can be carried out to determine students' perceptions regarding the achievement of reading comprehension skills for students who have taken the Extensive Reading course in the EFL class at UNRIKA, most of whom chose 'Agree' (A) and 'Neutral' (N), in each statement, each criterion in the questionnaire refers to HOTS as a result of its creative implementation, critical thinking, problem solving, and decision making in reading comprehension and can improve their skills in the teaching and learning process.

Table 1. *Creative Thinking (Witdianti, 2023)*

No	Statement	Scale				
		SD	D	N	A	SA
1	I can develop reading ideas into new and more engaging concepts.	0 0.0%	2 7.7%	8 30.8%	12 46.2%	4 15.4%
2	I often connect reading texts with personal experiences in a creative way.	0 0.0%	1 3.8%	5 19.2%	13 50.0%	7 26.9%
3	I am able to summarize reading texts from a different point of view.	0 0.0%	0 0.0%	7 26.9%	16 61.5%	3 11.5%
4	I can add new ideas not mentioned in the text to enrich its meaning.	0 0.0%	1 3.8%	10 38.5%	11 42.3%	4 15.4%

Higher Order Thinking Skills (HOTS) serve as a valuable framework for fostering students' creative thinking abilities. Creative thinking is essential in enabling learners to interpret and interact with reading texts more deeply. The data collected reflect students' self-perceptions regarding their creative thinking skills. Analysis indicates that the majority of responses fall within the "Agree" and "Neutral" categories. As shown in Table 1 in Agree (A) scale, the first statement comprised 12 (46,2%) students, the second statement comprised 13 (50%) students, the third statement comprised 16 (61,5%) students, and the fourth statement comprised 11 (42,3%) students. On the Neutral scale (N) the first statement comprised 8 (30,8%) students, the second statement comprised 5 (19,2%), the third statement comprised 7 (26,9%), and the fourth statement comprised 10 (38,5%) students. While a substantial number of students acknowledge their creative thinking abilities, a notable proportion express uncertainty, particularly when it comes to generating original ideas beyond the provided text. This suggests that while creative thinking skills are developing, they are not yet fully established. On average, the percentage of agreement suggests that creative thinking has a positive impact on reading comprehension by enabling students to analyze, extrapolate, and reinterpret ideas beyond the original content.

Table 2. *Critical Thinking (Witdianti, 2023)*

No	Statement	Scale				
		SD	D	N	A	SA
5	I am able to distinguish between facts and opinions in a reading text.	0 0.0%	0 0.0%	4 15.4%	14 53.8%	8 30.8%
6	I can identify weaknesses in the arguments presented in the text.	0 0.0%	2 7.7%	16 61.5%	7 26.9%	1 3.8%
7	I am able to question the truthfulness of the information presented in the text.	0 0.0%	4 15.4%	10 38.5%	8 30.8%	4 15.4%
8	I can identify the author's bias or tendency in the text.	0 0.0%	1 3.8%	14 53.8%	10 38.5%	1 3.8%
9	I am able to provide logical reasons for the conclusions drawn from the text.	0 0.0%	2 7.7%	8 30.8%	14 53.8%	2 7.7%
10	I am able to evaluate the validity of the information in the text based on reliable sources.	0 0.0%	2 7.7%	14 53.8%	8 30.8%	2 7.7%
11	I can construct counter-arguments against the opinions presented in the reading.	1 3.8%	2 7.7%	7 26.9%	15 57.7%	1 3.8%

Critical thinking in reading comprehension involves students' ability to analyze, interpret, and evaluate textual information thoughtfully. To determine the extent to which these skills are utilized within an EFL reading context, a set of questionnaire items was administered to assess students' self-reported proficiency in critical thinking. The data presented below reflect their perceptions during the reading process. A considerable number of students selected either "Agree" or "Neutral" for items concerning the ability to distinguish facts from opinions, question the reliability of information, identify bias, and formulate logical counterarguments. Table 2 refer that in Agree scale (A), the fifth statement comprised 14 (53,8%) students, the sixth statement comprised 7 (26,9%), the seventh statement comprised 8 (30,8%) students, the eighth statement comprised 10 (38,5%), the ninth statement comprised 14 (53,8%) students, the tenth statement comprised 8 (30,8%), the eleventh statement comprised 15 (57,7%) students. On the Neutral scale (N) the fifth statement comprised 4 (15,4%) students, the sixth statement comprised 16 (61,5%) students, the seventh statement comprised 10 (38,5%) students, the eighth statement comprised 14 (53,8%) students, the ninth statement comprised 8 (30,8%) students, the tenth statement comprised 14 (53,8%) students, and the eleventh statement comprised 7 (26,9%) students. Overall, the findings indicate that responses related to critical thinking predominantly fall within the neutral range, highlighting a tentative understanding of advanced analytical skills such as evaluating claims and recognizing bias. This suggests that although students are aware of these cognitive strategies, many still lack the confidence or capability to apply them independently. Continued practice and targeted instruction are essential to deepen their ability to critically engage with texts, an integral component in fostering higher-level reading comprehension.

Table 3. *Problem Solving (Witdianti, 2023)*

No	Statement	Scale				
		SD	D	N	A	SA
12	I can find solutions to the problems presented in the reading text.	0 0.0%	1 3.8%	9 34.6%	12 46.2%	4 15.4%
13	I am able to identify the main issue in the text and explore alternative solutions.	0 0.0%	2 7.7%	8 30.8%	14 53.8%	2 7.7%
14	I am able to create an action plan based on the problems found in the reading text.	0 0.0%	0 0.0%	13 50.0%	11 42.3%	2 7.7%
15	I am able to evaluate several alternative solutions to the problem in the text and choose the best one.	0 0.0%	0 0.0%	15 57.7%	9 34.6%	2 7.7%

Problem solving in reading comprehension refers to the students' ability to identify key issues in a text and explore possible solutions through analysis and reasoning. This includes their competence in recognizing problems, formulating alternative

responses, and evaluating the best course of action based on textual evidence. The following responses reflect how students perceive their ability to apply these strategies when encountering problems presented in reading materials. From the analysis results, it can be found that the more dominant answers are neutral and agree. Table 3 refer that in Agree (A) scale, the twelfth statement comprised 12 (46,2%) students, the thirteenth statement comprised 14 (53,8%) students, the fourteenth statement comprised 11 (42,3%) students, and the fifteenth statement comprised 9 (34,6%) students. On the Neutral (N) scale, the twelfth statement comprised 9 (34,6%) students, the thirteenth statement comprised 8 (30,8%) students, the fourteenth statement comprised 13 (50%) students, and the fifteenth statement comprised 15 (57,7%) students. For the conclusion, this implies that students are beginning to actively engage in solving hypothetical or implied problems presented in reading texts. Such skills are crucial in transforming passive reading into an interactive and analytical learning experience. Although several students can identify problems, many hesitate when applying or evaluating multiple solutions. A pedagogical focus on structured reasoning tasks may help reduce uncertainty and promote confidence.

Table 4. *Make Decision (Witdianti, 2023)*

No	Statement	Scale				
		SD	D	N	A	SA
16	I can make appropriate decisions based on the information in the text.	0 0.0%	1 3.8%	9 34.6%	12 46.2%	4 15.4%
17	I am able to consider various factors before making a decision based on a text.	0 0.0%	1 3.8%	9 34.6%	11 42.3%	5 19.2%
18	I can explain the reasons behind the decisions I make after reading a text.	0 0.0%	0 0.0%	10 38.5%	10 38.5%	6 23.1%

Decision making in reading comprehension involves the ability to draw conclusions and select the most appropriate response based on information presented in the text. This includes considering multiple factors, justifying choices, and applying critical judgment to make informed decisions. Decision making in reading comprehension involves the ability to draw conclusions and select the most appropriate response based on information presented in the text. This includes considering multiple factors, justifying choices, and applying critical judgment to make informed decisions. The following data represents students' self-perception in making decisions after analyzing and interpreting reading materials. From the analysis results, it can be found that the more dominant answers are neutral and agree. Table 4 refer that in Agree (A) scale, the sixteenth statement comprised 12 (46,2%) students, the seventeenth statement comprised 11 (42,3%) students, and the eighteenth statement comprised 10 (38,5%) students. On the Neutral scale (N), the sixteenth statement comprised 9 (34,6%)

students, the seventeenth statement comprised 9 (34,6%) students, and the eighteenth statement comprised 10 (38,5%) students. As final conclusion, the analysis was found that students are not only understanding the text but are also attempting to apply the information in meaningful ways, which aligns with the goal of HOTS to foster informed and reflective decision-making skills.

The next phase of this study involved a more objective assessment through a reading test. This test was structured based on the HOTS evaluation rubric which emphasizes three core components it is critical thinking, transfer of knowledge, and problem-solving, adapted from (Brookhart, 2011). Rather than merely assessing students' literal understanding of texts, the test was designed to gauge their ability to reason, critically assess arguments, and generate solutions in response to the content they read.

Table 5. *Higher-order Thinking as Critical Thinking (Brookhart, 2011)*

Question	Score	Number of Students	Percentage
1. What is the main problem in the story "The Missing Necklace"? Explain who is involved and why the problem is important.	20	17	65%
	10	9	35%
	0	0	0%

This question required students to analyze the main problem in the story and identify the involved characters and the importance of the problem. With 65% scoring full marks, most students demonstrated high-level critical thinking with clear, relevant, and complete arguments. Those scoring mid-range likely presented partially complete justifications. The lack of zero scores indicates all students provided at least some level of analytical response.

Table 6. *Higher-order Thinking as Critical Thinking (Brookhart, 2011)*

Question	Score	Number of Students	Percentage
2. In your opinion, which part of the story is the most important? Explain why that part is important to you?	20	23	88%
	10	3	12%
	0	0	0%

Students had to evaluate the most important part of the story with personal justification. The high percentage of students with top scores (88%) suggests that learners effectively connected story elements to personal interpretations using logical arguments. This reflects a strong evaluative ability across the class.

Table 7. *Higher-order Thinking as Transfer (Brookhart, 2011)*

Question	Score	Number of Students	Percentage
3. Do you agree with the way Anna handled the necklace she found? Give your reasons	20	21	81%
	10	5	19%
	0	0	0%

This item tests students' ability to relate the content of the problem to their own values. The majority of responses (81%) demonstrated high transfer thinking skills, indicating clear and relevant evaluations. The 19% who scored moderately may have lacked clarity or depth in their reasoning.

Table 8. Higher-order Thinking as Transfer (Brookhart, 2011)

Question	Score	Number of Students	Percentage
4. What do you think if this story happened in real life? Do you think other people would do the same as Anna? Why or why not?	20	22	85%
	10	4	15%
	0	0	0%

In this question, students were asked to relate the fictional scenario to real-life behavior. With 85% scoring the highest, most students successfully demonstrated the ability to generalize and apply the situation beyond the text. Responses showed strong reasoning and real-world insight.

Table 9. Higher-order Thinking as Problem Solving (Brookhart, 2011)

Question	Score	Number of Students	Percentage
5. Create an ending for the story. For example: Anna does not find the owner of the necklace. What would she do next? Write your version of the ending.	21 - 30	20	77%
	11 - 20	4	15%
	0 - 10	2	8%

This item assessed students' ability to create a new ending, which involved solution generation. The majority (77%) scored in the highest bracket, indicating they were able to generate creative, complete, and contextually appropriate endings. The 15% in the mid-range likely showed adequate ideas but lacked detail or clarity. The 8% scoring low may have struggled to structure their solutions or misunderstood the scenario.

Table 10. Higher-order Thinking as Problem Solving (Brookhart, 2011)

Question	Score	Number of Students	Percentage

6.	If you were Anna, what would you do after finding the necklace? Write a short plan of the steps you would take.	21 - 30	19	73%
		11 - 20	5	19%
		0 - 10	2	8%

Students were asked to write a realistic action plan, testing structured problem-solving. With 73% in the highest category, most learners provided logical and detailed steps. The mid-range (19%) responses likely lacked depth or coherence. Those in the lowest range (8%) may not have met the task expectations clearly.

Table 11. *Category of Assessing Higher Order Thinking Skills (Akib & Ghafar, 2015)*

Score Interval	Amount	Level of Students' higher order thinking
74 - 100	21	Excellent
47 - 73	5	Good
0 - 46	0	Poor

The recapitulated findings indicate that out of a total of 26 respondents, 21 students (80.77%) were classified under the Excellent category in terms of their Higher Order Thinking Skills (HOTS). This outcome reflects that the majority of students demonstrated a high-level ability to integrate critical thinking, transfer, and problem-solving skills in a comprehensive manner. This achievement corresponds to consistently high scores across test items 1 to 6, ranging from perfect scores (10) to the highest scoring intervals (21–30), highlighting their capacity to clearly identify key issues, connect fictional scenarios to real-life contexts, and propose creative yet logical solutions. Conversely, 5 students (19.23%) were categorized as Good (scoring between 47 and 73), indicating that although they possess substantial potential, their application of HOTS is not yet fully consistent. This inconsistency may stem from underdeveloped reasoning in arguments, incomplete solution plans, or a lack of confidence in evaluating information, resulting in responses that were partially formulated or insufficiently contextualized. Notably, no students fell into the poor category (scores between 0 and 46), suggesting that all participants demonstrated at least a foundational understanding of HOTS, with none failing to apply advanced thinking processes in their responses.

DISCUSSION

The findings of this study confirmed that the integration of Higher Order Thinking Skills (HOTS) in reading comprehension activities has a significantly positive impact

on students' analytical and reflective abilities. This result aligns with recent concerns in Indonesian EFL contexts, where students are often found lacking in interpretative, evaluative, and inferential reading skills. The results affirm that incorporating HOTS-based tasks in reading comprehension not only strengthens students' understanding of the text but also cultivates their analytical reasoning, creative decision-making, and problem-solving abilities.

The analysis of students' responses to the questionnaire revealed a generally positive perception of their Higher Order Thinking Skills (HOTS) in the context of reading comprehension. Across the domains of creative thinking, critical thinking, problem solving, and decision making, the majority of students selected "Agree" or "Neutral" options, indicating an awareness and emerging application of these cognitive skills. While many students confidently report the ability to think creatively and critically, as well as to make reasoned decisions, the prevalence of neutral responses especially in critical thinking and problem solving suggests that these skills are still in developmental stages and require further instructional support. Overall, the findings demonstrate that HOTS-based instruction in the Extensive Reading course has laid a solid foundation for higher-level reading comprehension, although continued pedagogical reinforcement is essential to fully cultivate these advanced cognitive abilities.

(Silalahi et al., 2022) conducted a setting using HOTS-based questions to assess students' comprehension of descriptive texts. Their results showed high levels of agreement in students' perceptions of HOTS, particularly in the remembering (58.4%), understanding (50.2%), applying (49.2%), and creating (53.3%) categories. However, their study focused primarily on the surface-level recall and comprehension using Likert-based perception data without performance-based reading tasks. In contrast, the present study combines both perception (questionnaire) and application (performance-based rubric) data, providing a more holistic view of students' competence.

Moreover, this study applies HOTS in narrative reading contexts rather than descriptive texts, demanding more complex skills such as synthesizing information and creating new endings. This approach revealed that 80.77% of students reached the "Excellent" category in HOTS application, suggesting a deeper engagement than reported in (Silalahi et al., 2022). While both studies underscore the effectiveness of HOTS, this study offers richer pedagogical insights by operationalizing HOTS not only as cognitive categories but also as observable student actions.

The next analysis is the reading test results, categorized under (Brookhart, 2011) HOTS framework, provides clear evidence of students' varying strengths across the three cognitive domains consist of higher order thinking as critical thinking, transfer, and problem solving. For high order thinking skill as critical thinking, the students

demonstrated notably strong performance in critical thinking tasks, particularly in identifying key narrative elements and providing evaluative judgments. In both questions under this category, a significant majority (65% and 88%, respectively) achieved full marks. This indicates that most students were capable of constructing clear, relevant, and logical arguments based on textual evidence. Importantly, the complete absence of zero scores further underscores the students' baseline competence in analytical thinking. For high order thinking skill as Transfer, when assessed on their ability to apply textual content to real-world contexts and personal values, students again excelled. In the two transfer-oriented items, 81% and 85% of the participants scored at the highest level. These results suggest that students not only understood the narrative but were also able to reflect on its moral and social implications, demonstrating thoughtful personal engagement and contextual reasoning. For the last is high order thinking skill as problem solving. While still strong, performance in this domain was slightly more varied. A majority (77% and 73%) attained high scores, indicating that many students could creatively extend the narrative and design realistic action plans. However, the presence of mid-range and lower scores (up to 8%) in both items suggests that some students faced challenges in articulating structured, coherent, and innovative solutions potentially due to weaker planning skills or limited exposure to such open-ended tasks.

The collective findings from the three categories of item analysis consist of critical thinking, transfer, and problem solving, highlight a generally high level of cognitive engagement among students. Their strong performance in critical thinking tasks confirms their ability to appropriately analyze and evaluate textual information. Results in transfer demonstrate students' capacity to connect reading content to broader real-life contexts, indicating reflective and personal reasoning. Meanwhile, while problem solving also yielded mostly high scores, the more varied results suggest that students are still refining their ability to construct responses and formulate solutions independently. These patterns suggest a strong foundation of HOTS development, with targeted pedagogical interventions needed to further strengthen problem-solving competencies.

(Hamma et al., 2023) assessed HOTS through reading comprehension tests and found that students performed well in transfer (C4) (81.8%) and moderately in critical thinking (C5) (54.5%), but struggled significantly in problem solving (C6) (9.1%). In contrast, this study demonstrates more balanced results across all three dimensions, particularly in the problem solving domain, where 73%–77% of students performed at the higher levels. This discrepancy may be attributed to the nature of the tasks. Whereas (Hamma et al., 2023) used closed-ended test items, the present study employed open-ended narrative-based tasks that required students to apply contextual judgment and design creative solutions. This suggests that the task format and context relevance are critical in eliciting deeper thinking and performance.

The findings of this study, particularly the high percentage of students categorized as "Excellent" in HOTS performance (80.77%), demonstrate a more substantial engagement with higher-order cognitive processes than those reported in several previous studies. For instance, although HOTS integration had a positive impact on students' reading achievement, the actual student outcomes remained varied due to inconsistencies in instructional delivery (Silalahi et al., 2022). In contrast, this study shows more consistent and measurable outcomes, with no students falling into the "Poor" category. Additionally, many teachers faced challenges in implementing HOTS due to a lack of training and resources, the current study's success may be attributed to the targeted activity it is creating new endings which directly encouraged synthesis, creativity, and problem-solving (Utami et al., 2021). Furthermore, the insufficient integration of HOTS elements in standard textbooks, this study effectively bypasses that limitation by designing custom reading assessments rooted in HOTS rubrics (Erdiana & Panjaitan, 2023). Hence, this study not only confirms the relevance of HOTS in EFL reading comprehension but also advances the discussion by providing concrete instructional methods and evidence of their effectiveness in improving students' higher-order thinking abilities.

These results support the premise that HOTS can be effectively integrated into reading comprehension when aligned with contextualized, narrative-based tasks. They also highlight the need for assessments that go beyond recognition and recall, fostering student agency and reflective judgment. Compared to prior studies, this research contributes a pedagogical model where HOTS are evaluated not only through what students believe they can do, but through what they demonstrably perform.

One probable explanation for the high student performance is the use of contextual, creative tasks like generating alternative story endings, which required students to actively examine, evaluate, and generate meaning. Another effect could be the students' prior experience with the extensive reading course, which presumably increased their readiness to engage in higher-order tasks. Furthermore, the use of rubrics based on the HOTS framework (Brookhart, 2011) helped to clearly identify the cognitive expectations of each activity, which guided both training and evaluation.

These findings have practical relevance for EFL teachers and curriculum developers. They emphasize the importance of incorporating HOTS-based activities into reading education, rather than simply asking comprehension questions. Structured, open-ended reading exercises can promote deeper thinking and student autonomy, which aligns with 21st-century educational aims. Teacher training programs should also include ways for creating HOTS-oriented reading activities to promote consistent and effective implementation.

Despite its merits, this study has certain shortcomings. First, the sample was limited to many EFL classes that had already finished an extended reading course at a single university, which may have influenced the results' generalizability. Second, the emphasis on narrative texts may not accurately reflect HOTS interaction with other genres. Future research might look at HOTS implementation in expository or argumentative texts, involve bigger and more varied populations, and investigate the long-term effects of HOTS-based instruction to gain a more complete picture of its effectiveness.

CONCLUSION

This study highlights that incorporating Higher Order Thinking Skills (HOTS) into reading comprehension activities in an English as a Foreign Language (EFL) learning environment has a powerful impact on improving students' critical, creative, and reflective thinking abilities. The use of student perception questionnaires and performance-based assessments revealed that learners demonstrated significant strengths in key HOTS dimensions such as critical thinking, knowledge transfer, and problem-solving. These results align with the study's core objective of evaluating how students engage with HOTS and also demonstrate that imaginative tasks, such as developing alternative endings to stories, can effectively stimulate deeper understanding and cognitive engagement.

The implications of these findings extend beyond the immediate learning environment. They offer strong evidence supporting the integration of HOTS-oriented approaches into reading pedagogy, particularly in EFL contexts where learning often remains centered on literal comprehension. Unlike previous research limited to perception-based data or narrow skill areas, this study combines both perception and performance indicators to provide a more complete picture of students' higher-order thinking. Furthermore, the findings emphasize that open-ended, context-based tasks are more capable of eliciting complex thinking than conventional question formats.

Several factors may explain these positive results, including students' prior exposure to Extensive Reading classes and the use of a clear HOTS-based assessment rubric, which helped clarify expectations. However, this study is not without limitations. It involved a relatively small and homogeneous sample from a single university, which may limit the broad applicability of the results. Furthermore, because this study focused only on narrative texts, future research should investigate the integration of HOTS in broader reading genres, such as expository or argumentative texts, to gain a more comprehensive perspective.

From a practical standpoint, these findings encourage educators and curriculum designers to develop reading materials and activities that challenge students cognitively. There is also a pressing need for professional development that equips

teachers with strategies for implementing HOTS effectively and consistently. Future research should involve more diverse student groups and examine the long-term impact of sustained HOTS-based reading instruction.

In conclusion, this study makes a valuable contribution to language education by demonstrating that HOTS-oriented reading tasks can significantly improve students' analytical and interpretive abilities. It presents a replicable teaching approach that not only enhances classroom learning but also equips students with the cognitive skills necessary for thoughtful engagement in academic and real-world situations.

CONFLICT OF INTEREST

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

AUTHOR (S) CONTRIBUTION

Akbar, F.F.: Conceptualization (main), methodology (main), writing original draft (main), reviewing (main), editing (main), securing funding. Wilany, E.: methodology (main), original draft writing (supporting), review (main). Siahaan, S.: methodology (supporting), review (supporting).

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