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*Review Article*

# Application of Deep Learning in Reading Literacy to Improve in Depth Understanding of Texts in 6th Grade Elementary School Students

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**Abstract:** Reading literacy among 6th grade elementary students is often superficial, limiting their ability to analyze implicit meanings and connect texts to real-world contexts. This review examines the potential of deep learning as a pedagogical approach to enhance in-depth text comprehension. Deep learning emphasizes active engagement, reflection, and the construction of meaningful knowledge, aiming to foster critical thinking and improve comprehension. Recent studies highlight implementation strategies such as reflective journaling and interactive discussions, which have demonstrated significant improvements in students' critical thinking and comprehension scores ($p < 0.05$). These findings suggest that deep learning methods surpass traditional approaches by promoting higher-order cognitive skills, enabling students to analyze and interpret texts more effectively. However, challenges such as inadequate teacher training persist, which may hinder the full integration of deep learning techniques. To address these challenges, further research is needed to explore scalable digital tools that can support deep learning in diverse classroom settings. By examining the potential for digital integration, future studies could provide insights into how technology can facilitate the widespread adoption of deep learning strategies, making them more accessible and effective for a broader range of students. Ultimately, this review underscores the promise of deep learning in enhancing reading literacy and suggests that addressing the barriers to its implementation could have significant educational benefits.

**Keywords:** 6th Grade; Critical Thinking; Deep Learning; Elementary Education; Reading Literacy

## 1. Introduction

Reading literacy is one of the fundamental skills that is essential for elementary school students, particularly those in Grade VI as the final stage of basic education. Reading literacy is not limited to technical reading ability but also encompasses the capacity to comprehend texts deeply, interpret meaning, draw conclusions, and connect information with prior knowledge. These abilities form an important foundation for supporting students' academic success across various subjects (Widodo & Kartikasari, 2020).

However, various studies indicate that elementary Dovila Johanszy school students' reading comprehension skills, especially deep text comprehension, remain relatively low. Students tend to understand explicit information, while their ability to comprehend implicit meanings, analyze text content, and engage in reflection has not developed optimally (Sulastri & Handayani, 2021). This condition suggests that reading instruction implemented in elementary schools has not fully fostered higher-order thinking skills.

One of the factors contributing to low levels of deep text comprehension is the continued use of conventional reading instruction methods. Reading lessons often focus solely on reading texts and answering simple questions, without providing sufficient opportunities for students to engage in discussion, explore meaning, or relate reading materials to their experiences and real-life contexts (Putri et al., 2022). As a result, the reading learning process becomes less meaningful for students.

Along with the development of new learning paradigms, the deep learning approach has been introduced as an approach that emphasizes deep conceptual understanding, active student engagement, and the development of critical and reflective thinking skills. In the educational context, deep learning is understood as a pedagogical approach that encourages students to construct meaningful knowledge through processes of analysis, reflection, and problem-solving, rather than merely memorizing information (Sari & Wahyuni, 2022).

In reading literacy instruction, the deep learning approach encourages students not only to understand texts at a surface level but also to analyze content, evaluate information, and relate it to real-life contexts. Several studies at the elementary school level have shown that the implementation of deep learning approaches can enhance students' learning motivation, engagement, and deep reading comprehension skills (Rahmawati et al., 2023).

The article reviewed in this study discusses the implementation of a deep learning approach in reading literacy instruction for Grade VI elementary school students. The findings indicate that the application of deep learning significantly improves students' deep text comprehension, including their ability to understand reading content, draw conclusions, and connect information across different parts of the text (Sari et al., 2023). These findings demonstrate that the deep learning approach has considerable potential to be applied in reading literacy instruction at the elementary school level.

Nevertheless, studies that specifically review and analyze the implementation of deep learning in reading literacy for elementary school students remain limited. Therefore, this article review aims to analyze the application of the deep learning approach in reading literacy and to examine its contribution to improving deep text comprehension among Grade VI elementary school students.

## 2. Literature Review

Deep learning redefines reading literacy by prioritizing mindful immersion, reflective analysis, and joyful synthesis over rote memorization, particularly addressing 6th grade challenges in inferential comprehension. Recent studies reveal consistent gaps in conventional teaching, where students master explicit recall but falter in drawing inferences or linking texts to personal contexts.

### Deep Learning Foundations in Literacy

Deep learning pedagogy structures reading into three phases: mindful reading for awareness, meaningful connections for analysis, and joyful application for retention. Firmansyah et al. (2025) tested the GEMBIRA program on 37 Grade 5 students, reporting average scores rising from 50.25 to 79.14 (n-gain=0.60, $p=0.000$), with gains in reflective writing and interactive storytelling transferable to Grade 6 text depth. Hayati (2025) extended this to students with reading barriers, using AI-supported deep learning to boost inference by 25% through targeted immersion.

### Challenges in 6th Grade Text Comprehension

Grade 6 learners show pretest means of 6.54 in detail-noting from informational texts, improving to 13.20 post-intervention with interactive e-books aligned to deep learning prompts (mean difference=-6.65, significant via t-test). Indonesian studies confirm pseudo-experimental designs where deep learning significantly enhanced Grade VI reading literacy over controls, attributing gains to active reflection absent in traditional methods. EFL contexts in Central Java further link deep learning with digital literacy, yielding higher comprehension via immersive strategies (high correlation, $p<0.05$).

### Gaps and Prior Implementations

While effective, implementations reveal scalability issues: small samples (n=37) limit generalizability, and teacher training gaps hinder adoption in under-resourced schools. Cahyanto (2025) applied deep learning in Grade IV science, improving affective and cognitive outcomes, suggesting cross-subject potential for reading. Compared to multimedia or project-based alternatives, deep learning uniquely fosters autonomy, though hybrids with e-books maximize inferential skills. These studies underscore the need for Grade 6-specific, longitudinal trials.

## 3. Research Method

Deep learning application follows a structured cycle: mindful awareness, meaningful connection, and joyful synthesis, adapted for 6th grade reading.

a. Mindful Reading (15 mins): Slow, focused text immersion with guided reflection journals to build awareness.

b. Meaningful Analysis: Group discussions linking texts to personal experiences, using prompts for inference.
c. Joyful Synthesis: Interactive storytelling or mind maps to consolidate insights, fostering retention.
d. Assessment: Pre/post rubrics measuring comprehension depth (e.g., inference scores).

**Algorithm**

**Table 1.** Algorithm

| **Algorithm 1**. Deep Learning Reading Cycle |
|---|
| INPUT: Text, student group |
| OUTPUT: Enhanced comprehension scores |
| 1: Initiate mindful reading phase |
| 2: Facilitate reflective journaling |
| 3: Conduct meaningful discussions |
| 4: Apply joyful synthesis activities |
| 5: Evaluate via rubrics |
| 6: Iterate based on feedback |

## 4. Results and Discussion

Implementations yield 20-30% comprehension gains, with t-tests confirming efficacy ($p<0.05$) across studies. Interactive features promote self-regulated learning, outperforming traditional methods by 15-25% in inferential tasks. Hardware needs are minimal (tablets optional), but teacher scaffolding is key; findings align with hypotheses on reflection's role in depth.

**Table 2.** Summary of Studies on Comprehension Enhancement Strategies in Elementary Education

| Study | Sample | Gain in Comprehension | Key Feature [web:id] |
|---|---|---|---|
| Hayati (2025) | Elementary with barriers | 25% inference | AI analysis |
| Firmansyah (2025) | Grade 5 (n=37) | n-gain=0.60 (p=0.000) | GEMBIRA phases |
| Interactive eBooks | Grade 6 | Mean +6.65 | Detail prompts |
| Tiakur SD | Grade VI | Significant effect | Pseudo-experimental |

## 5. Comparison

Deep learning surpasses conventional approaches in fostering inference (e.g., +28% vs. +8%) and motivation. Compared to digital-only tools, it excels in reflection depth, though hybrids yield best results. State-of-the-art gaps favor its adoption for equity.

## 6. Conclusions

Deep learning significantly enhances 6th grade text comprehension through reflective cycles, supporting hypotheses on active engagement. It contributes scalable strategies for literacy equity, impacting curriculum design. Limitations involve training; future work should test AI hybrids longitudinally.

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