Disrupting Reading through the Invisible Presence of AI: Rethinking Credibility and Critical Reading in Primary Education

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Abstract. *Primary school students increasingly encounter artificial intelligence (AI) in subtle, often invisible ways—through search engines, recommendation systems, and automated summaries. Although not direct users of generative AI, they are regularly influenced by its presence. This paper conceptualizes AI as a pedagogical disruption that reshapes reading from decoding to critical inquiry and evaluation. It highlights the need to foster critical reading skills that enable students to question sources, detect bias, and understand algorithmic influence, redefining literacy as an active, reflective process in an AI-shaped digital environment.*

Keywords. Critical reading, digital literacy, educational disruption, invisible presence of artificial intelligence, primary education

1 Introduction

In today's digitally mediated environments, children encounter AI technologies from early on–often before formal schooling. Voice assistants (e.g., Siri, Alexa), curated video content on YouTube, and adaptive learning apps are just some of the ways AI enters children's daily lives (Arora & Arora, 2022). These interactions may be direct–when children actively engage with AI tools–or indirect, through systems designed for adults but accessible to children. In both cases, children become active participants in AI-shaped digital ecosystems, though the mechanisms often remain opaque to young users (Gampe et al., 2023).

By primary school, many children have already developed habitual ways of interacting with digital content, shaped by personalization, filtering, and prediction (Voulgari et al., 2024). In school, students engage with AI-powered platforms (Butler & Starkey, 2024) both explicitly (e.g., digital textbooks with audio-summarization, adaptive learning systems) and implicitly (e.g. search engines, autocomplete, recommendation algorithms).

A growing share of content is no longer solely human-generated; it is created, curated, or filtered by AI–often without students realizing (Zhou et al., 2024). While they may not use generative AI tools directly, students are nonetheless regularly influenced by them – through personalized search results, automated suggestions, and algorithmic summaries that shape what they read, how they read, and how they evaluate its credibility.

This *invisible presence of AI* alters how students access, interpret, and evaluate information (Steele, 2023). The term refers to the systemic, often unnoticed influence of algorithms and automated systems that shape reading experiences—even when AI is not perceived as a technological actor. In this context, the traditional view of reading as decoding and comprehension are no longer sufficient. Contemporary reading literacy must also include the ability to identify sources, assess reliability, interpret intent, and distinguish between human and AI-generated content (Sanchez-Acedo et al., 2024).

These complex skills do not develop spontaneously, especially in young readers still mastering basic literacy. Their acquisition requires targeted pedagogical support and well-designed didactic strategies (Kerneža & Kordigel, 2022; Kordigel Aberšek & Kerneža, 2023).

This paper argues that the pervasive, often invisible integration of AI into reading environments constitutes a *productive disruption* in reading education. This shift requires rethinking the aims, methods, and assumptions of reading instruction. Rather than viewing AI solely as a tool, we conceptualize it as a pedagogical challenge that redefines reading as an interpretive, critical, and evaluative act. Special emphasis is placed on fostering critical reading literacy, enabling students to navigate automated

information landscape with awareness, independence, and responsibly.

2 Invisible AI and the Changing Nature of Reading

AI increasingly shapes children's reading experiences in ways that are not immediately visible or recognized as technologically mediated. While children are often labeled indirect users of AI, this distinction can be misleading. They frequently engage directly with AI-powered tools–voice assistants, educational platforms, or embedded recommendation systems. The key difference lies in visibility and agency: tools like ChatGPT require active input, while others work in the background, shaping information without user's awareness.

Many digital environments used by children are not designed with their best interest in mind. On platforms commonly accessed by primary school students, AI operates discreetly—through search suggestions, automated summaries, and recommendation algorithms (e.g., Nini & Kong, 2021; Zammit et al., 2022). This hidden integration creates a new reading reality: students often read algorithmically shaped content without realizing it.

Examples include search engines where autocomplete suggestions appear instantly, and personalized results vary by user profile. Featured snippets—automatically generated summaries—are often accepted uncritically (e.g., Al-Rawi et al., 2022; Huyen et al., 2019).

A similar dynamic occurs on platforms like YouTube Kids, where recommended content is based on previous viewing history (Rieder et al., 2020), rather than on didactic value (Vogelman-Natan, 2021). Digital textbooks increasingly offer AI-driven tools—auto-summaries, answer generators, and predictive suggestions. While convenient, these can lead to shallow understanding, as students may skip cognitive processing. AI becomes a shortcut to an answer, not a path to comprehension (Panit, 2024).

AI also appears in everyday tools such as web browsers and office software. Chrome, Word, and Gmail include features like Smart Compose, grammar checking, and stylistic corrections, enabling students to generate full sentences with little effort (Wang, 2024). Voice assistants (e.g., Siri, Alexa) provide general answers, often without sources or content (Hocutt, 2021).

In all these cases, AI silently co-constructs the reading experience. Content appears neutral, though it is filtered, summarized, and predicted by opaque algorithms. This encourages passive intake and discourages questioning and verification.

Thus, reading today is not only comprehension—it requires awareness of the technology behind the text. Students must learn to detect how AI shapes content develop strategies for critical evaluation. Without such skills, they risk information overload, manipulation, and superficial literacy.

In some cases, AI doesn't just reshape how students read–it reduces the need to read. Voice interfaces, audio summaries, and predictive tools can replace reading with listening or auto-generated responses. While beneficial for accessibility, such features raise concern: reduced reading motivation, less exposure to complex texts, and increased passivity. These trends underscore the urgency of cultivating reflective and critical reading habits in AI-mediated environments.

3 Critical Reading as an Educational Imperative

In a digital environment where readers rarely encounter a visible author, critical reading becomes essential. AI is no longer just a tool—it acts as a co-constructor of the reading process, with algorithms silently shaping how information is presented (Zemljak & Kerneža, 2024).

Decoding remains fundamental in early reading, but today's environment demands more. Students must develop skills in source evaluation, contextual understanding, and bias detection. Without questions like *Who created this? Why this source? Why now?*; reading risks becoming superficial skimming, where impressions replace understanding (Wexler et al., 2019).

Critical reading now requires attention to context: Who produced the content? For what purpose? Based on which data? In what environment? Stefanov Dimov, 2024). This context increasingly includes AI, which—often without the reader's awareness—influences selection, tone, and structure of what is read (Jiang et al., 2024). Reading thus becomes an act of interpretation, where student shifts from passive recipient to active meaning-maker. While reading has always been shaped by its context, the novelty lies in AI's dynamic, real-time shaping of content – requiring new forms of critical awareness.

The need is particularly urgent in primary education, where younger students often lack skills to verify sources or recognize misinformation (Kerneža & Kordigel, 2022; Kordigel Aberšek & Kerneža, 2023). They are rarely aware that AI is not a neutral transmitter but an active participant in shaping knowledge (Jiang et al., 2024). Teachers, meanwhile, may hesitate to address AI due to unclear curricula, lack of training, or doubts about developmental readiness (Su, 2024).

This paper argues that critical reading is not an advanced literacy skill–but its foundation. It includes comprehension, questioning, verification, justification, and awareness and digital mediation. These must be cultivated from the earliest school years.

When student ask–*Why did the algorithm show me this? Can I trust it? Who is behind it?*—they are not merely completing a task but engaging in democratic literacy.

In this way, reading instruction transforms–from linear knowledge transmission to a dialogue between student, text, and technology. AI is not just a topic of instruction but a didactic challenge, calling on the teacher to act not as a transmitter, but as a mentor of interpretation and critical judgment.

4 AI as a Pedagogical Opportunity for Fostering Critical Thinking

In schools, AI is often seen as a shortcut to answers. Yet this convenience can replace the effort of thinking. When students receive ready-made outputs from systems that don't think but combine, they may stop asking questions altogether (Mah et al., 2024). But this disruption offers a didactic opportunity: if addressed pedagogically, AI can become a catalyst for developing critical literacy.

Unlike traditional tools, AI acts as a co-creator. It can serve as a writer, explainer, dialogue partner—or a source of error and bias. This complexity invites reflection: *Who created this information? For what purpose? How can it be verified?* (Walker et al., 2025).

Research shows that less experienced often accept AI-outputs uncritically (Cail, 2024) and struggle to distinguish them from human ones (Fritz, 2025). Younger students are particularly vulnerable—they tend to trust structured, seemingly "definitive" answers without understanding how they were produced (Horodenko et al., 2024; Johnston, 2020).

Avoiding technology is not the answer. Instead, AI should be used as an imperfect partner in thinking, prompting comparison, verification and justification. Here, the teacher becomes a moderator of interpretation, not a supplier of answers.

To support this shift, researchers and practitioners have proposed tasks–aligned with critical digital literacy frameworks (Revell et al., 2024; Yue Yim, 2024)–which may be adapted for primary classrooms:

- **Dialogues with AI.** Students test how different prompts affect responses, exploring how wording, tone, or specificity changes AI output. This develops metacognitive awareness and shows that answers are shaped by interaction. In early grades, teachers can scaffold this through shared discussions and modeled prompting (Walter, 2024).
- **Human vs. AI comparison tasks**. Students compare AI-generated and human-written texts, focusing on tone, structure, sources, and reasoning. While AI texts often appear formal, they typically lack depth and nuance—a gap that becomes clear through classroom comparisons (Revell et al., 2024). Younger students might begin with simple narrative variations, progressing toward critical evaluation.
- **Detecting algorithmic bias**. Students analyze AI outputs for patterns—what is omitted, repeated, or simplified? They may notice missing perspectives or overused formats (like lists or definitions). Teachers guide discussions on how design choices and training data shape bias. Inclusive AI literacy frameworks emphasize integrating these ethical and epistemic questions early (Yue Yim, 2024).
- **Combining AI with trusted sources**. Students compare AI-generated content with information from books, encyclopedias, or reliable websites. They **synthesize both into a reflective summary**, citing each source. This fosters triangulation, evaluation, and the understanding that AI is **just one source**—not an authority. In early stages, this may take the form of comparing a print text with AI's version, guided by teacher questioning.

In this way, AI shifts from threat to provocation—inviting students to question, analyze, and co-construct meaning. The teacher becomes a mentor of doubt, opening space for distance, reflection, and dialogue with texts–even when the texts is machine-shaped.

5 Conclusion

This paper has argued that AI is not just a technical tool but a disruptive force that reshapes children's reading experiences from the earliest stages. The content they encounter is no longer neutral–it is filtered, summarized, or generated by invisible algorithmic systems. This opacity demands a new kind of reading attention.

Reading today extends beyond decoding text; it requires recognizing technological mediation. Questions such as *Who created this information? Why in this form? How can it be verified?* are now central to reading literacy. While not entirely new, such questions have become essential in an AI-shaped information ecosystem, where algorithms invisibly influence content selection, tone, and visibility.

Literacy in this context becomes a capacity for judgment, verification, and ethical orientation, calling for new didactic strategies and a redefined teacher role. The shift is not just methodological but pedagogical: from delivering knowledge to fostering critical engagement with information.

These insights align with European education policies, including the *Digital Education Plan* (2021–2027) (European Commission, 2020), and *DigComp 2.2* (Vuorikari et al., 2022), both of which emphasize early development of digital competence, critical thinking, and the ability to distinguish human from automated content. Embedding these frameworks in

classroom practice can help align national curricula with shared European goals.

Nonetheless, this study has limitations. It does not offer large-scale empirical data or classroom-based interventions. Its claims are conceptual and theoretical. Further research is needed on the developmental readiness of young learners for AI literacy, and on the types of scaffolding and teacher competencies required to support this meaningfully.

This paper does not call for a radical overhaul of reading education, but rather a recalibration. AI's invisible presence invites us to rethink not only what students read–but how and why it is presented. If critically framed and contextually supported, AI can become not just a challenge, but a pedagogical opportunity.

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