WHIOCE PUBLISHING PTE. LTD.
PROVIDING
FIRST-CLASS SCIENTIFIC INFORMATION
FOR TOP SCHOLARS

2026 Volume 4, Issue 2
Contemporary Education Frontiers
ISSN (Online): 3029-1860 ISSN (Print): 3029-1879

The Practical Dilemmas and Implementation Paths of Digital Picture Books in Supporting Young Children's Deep Learning

Tengwei Fang, Yi Liu, Hui Deng, Mohan Liu*
School of Education, Jilin International Studies University, Changchun 130117, Jilin, China

**Author to whom correspondence should be addressed.*

Abstract: Digital picture books, with their multimodal narrative and interactive features, demonstrate unique advantages in stimulating young children's reading interest and promoting multimodal learning. However, current research and practice predominantly focus on superficial interest stimulation and knowledge acquisition, lacking in-depth exploration of how digital picture books can foster core competencies for deep learning in young children, such as thinking quality and inquiry ability. Based on a review of relevant research, this paper analyzes the practical dilemmas faced by digital picture books in supporting young children's deep learning, including technological bias, contextual fragmentation, and the absence of deep scaffolding. It then proposes practical pathways from four dimensions: conceptual reshaping, instructional integration, teacher guidance, and assessment design, aiming to provide references for the optimized design and educational application of digital picture books.

Keywords: digital picture books; deep learning in young children; multimodal learning; instructional intervention

Online publication: February 26, 2026

1. Introduction

Deep learning is a learning approach that contrasts with shallow learning, emphasizing the practical application of knowledge, intrinsic motivation, and the meaningful connection between new and old experiences. For preschool children, deep learning does not refer to the mastery of complex knowledge systems; rather, it refers to their ability to fully engage in activities driven by curiosity and interest, actively construct understanding, solve problems, and demonstrate certain critical thinking, creativity, and transferability skills through continuous interaction with their environment. This process serves as the foundation for children's lifelong learning and sustainable development.

Meanwhile, the rapid development of digital technology is profoundly reshaping children's early learning approaches and reading ecosystems. Among them, digital picture books, as a new type of reading medium that integrates text, images, animations, sound effects, and interactive functions, are gradually becoming an important part of early childhood reading. Compared to traditional paper-based picture books, digital picture books, with their vivid audiovisual effects and immediate interactive feedback, can effectively attract children's attention, stimulate reading interest, and provide children

with a multimodal learning experience[1]. However, the "double-edged sword" effect of technological intervention has also prompted cautious reflection from the academic community: Are digital picture books truly "cognitive scaffolds" that promote deep learning in young children, or have they simply become "attention traps" for entertainment purposes? This paper aims to explore the value and limitations of digital picture books in supporting deep learning in young children, analyze the current practical dilemmas, and on this basis, explore possible implementation pathways.

2. The Theoretical Possibilities and Practical Landscape of Digital Picture Books Supporting Deep Learning in Young Children

2.1. Digital Technology Driving the Transformation of Deep Learning

In early childhood education, digital technology demonstrates the potential to drive children from superficial acceptance to deep construction. Meta-analysis studies indicate that digital technology has a significant positive impact on promoting deep learning. By creating immersive and interactive learning environments, it effectively enhances learners' self-regulation abilities and self-efficacy, providing support for the occurrence of deep learning[2]. Specifically, digital tools such as tablets can serve as supportive scaffolds for children's reading comprehension: on one hand, functions like dialogue bubbles and emojis enable children to transition from passive information recipients to active constructors of textual meaning during the creation of digital works; on the other hand, when children conduct thematic research, write scripts, and integrate them into digital story videos using images, audio, and other tools, this complete creative process itself constitutes a form of deep cognitive processing, strongly supporting the realization of deep learning[3].

2.2. Digital Picture Books Empowering Multimodal Cognitive Development

The core advantage of digital picture books lies in their support for multimodal learning. By integrating multimedia elements such as voice narration, dynamic images, and sound effects, digital picture books guide young children to focus on key information through audiovisual enhancement designs, promoting the processing of text-image associations and self-explanation, and helping children analyze the logical structure of stories. This multimodal presentation approach aligns with young children's embodied cognition and multi-channel processing characteristics, helping to reduce cognitive load and enhance reading comprehension effects. Meanwhile, the interactive story experiences provided by digital picture books enable children to learn how to analyze how media such as images, sounds, and text collaboratively convey meaning during the process of understanding plots, fostering the emergence of critical multimodal literacy. Domestic research confirms that interactive functions can effectively attract attention and are more conducive to improving children's narrative evaluation abilities compared to paper-based picture books; AR picture books can enhance story reading effects and improve reading comprehension[4]; dynamic text is more effective than static text in stimulating reading motivation, facilitating young children's story retelling, and enhancing memory retrieval effects. In summary, with their multimodal and interactive features, digital picture books offer significant advantages in stimulating reading interest, promoting text-image understanding, and supporting narrative expression, providing potential technological support for young children's deep learning.

3. The Practical Dilemmas of Digital Picture Books Supporting Deep Learning in Young Children

Although digital picture books are increasingly widely applied in early reading and relevant research confirms their positive role in promoting cognitive development, from the perspective of fostering deep learning in young children, current research and practice still face numerous dilemmas.

3.1. Stimulating Interest Masks the Development of Thinking Quality

Currently, whether in the product design or teaching application of digital picture books, there is a prevalent tendency to equate "attracting children" with "promoting learning." Many commercial digital picture books are keen on stacking up dazzling animations, exaggerated sound effects, and high-frequency interactive points to maximize the maintenance of children's attention. While this to some extent stimulates young children's reading interest, it also easily leads to their attention being dispersed by formalized sensory stimuli, neglecting the understanding and contemplation of the deeper meaning of the story. Consequently, the entertainment function of technology hovers above cognitive support; the former seeks immediate feedback, while the latter requires mental immersion and meaning construction, creating an inherent tension between the two.

3.2. Technological Application Detached from Complete Teaching Context

Another prominent dilemma lies in the fact that research on digital picture book interventions and their application practices often focus on the technological presentation itself, failing to examine digital picture books within real, complete teaching contexts. Some studies adopt a single-variable control approach to compare the differences in immediate effects between digital and paper-based picture books, overlooking the crucial roles of teacher guidance, peer interaction, and extension activities in promoting deep learning in young children. The occurrence of deep learning is not an isolated technological event but a constructive process rooted in sociocultural contexts. Without heuristic questioning from teachers, the collision of ideas among peers, and inquiry-based activities based on the content of picture books, even if young children are exposed to high-quality digital content, it is difficult for them to achieve deep internalization and transfer application of knowledge. This disconnection between technology and context significantly diminishes the educational value of digital picture books.

3.3. Lack of Deep Scaffolding

Interactivity is one of the core characteristics that distinguish digital picture books from paper-based ones and is considered an important basis for supporting personalized learning. However, the interactive design of most current digital picture books remains at a superficial level of "tap feedback," where children tap an element, and the screen plays a preset animation or sound effect. Although this interactive mode can provide immediate feedback, it lacks deep intervention in children's cognitive processes. True cognitive scaffolding should be able to provide differentiated support, trigger cognitive conflicts, or promote metacognitive reflection based on children's responses. For example, it could offer appropriate hints when children encounter difficulties in understanding or guide them in story retelling, plot prediction, or opinion expression after completing reading. Unfortunately, digital picture books with such intelligent interactive and cognitive guidance functions are still scarce. There remains a significant gap to be bridged between being "interactive" and being "capable of thinking."

4. Practical Pathways for Digital Picture Books to Support Deep Learning in Young Children

To overcome the aforementioned dilemmas and truly unleash the potential of digital picture books in promoting deep learning among young children, it is urgent to explore practical pathways from multiple dimensions, including concepts, design, teaching, and evaluation.

4.1. Establishing Deep Goals Centered on Cognitive Development

The exploration of practical pathways begins with conceptual innovation. Educators, researchers, and developers of digital picture books should transcend the instrumental rationality that prioritizes fun and one-way knowledge transmission, and instead establish the promotion of young children's cognitive development as the core goal. This means that the application

of digital picture books should not only make children love reading and understand books but also encourage them to think actively and apply what they have learned. For example, after reading, children can be encouraged to ask divergent questions based on the plot of the picture book, evaluate the behavior of story characters in light of their own experiences, or even create their own continuations or adaptations of the story using simple digital tools. Only by integrating core competencies such as critical thinking, problem-solving abilities, and creativity into the entire process of applying digital picture books can their educational value be truly realized.

4.2. Integrating Digital Picture Books into Comprehensive Teaching Activities

The occurrence of deep learning requires a complete and authentic learning context. Digital picture books should not be regarded as isolated tools that replace teachers or traditional reading materials but should be organically integrated into comprehensive thematic teaching activities in kindergartens. In teaching practice, teachers can use digital picture books as anchors to stimulate inquiry interest or as resources to expand experiences. For example, when conducting a thematic activity on "The Secrets of Spring," teachers can first use an interactive digital picture book about spring to guide young children to perceive the characteristics of spring through multi-sensory channels such as sight and hearing. Subsequently, teachers can organize outdoor observations to verify the findings in the picture book, guide children to express their understanding of spring through painting and other means, and finally encourage children to create their own little stories about spring with the help of teachers using simple photo-taking and recording functions. In this process, digital picture books are no longer isolated reading materials but become an integral part of various learning activities such as observation, discussion, operation, and expression, providing fertile ground for young children's knowledge construction and transfer application.

4.3. Transitioning from "Technology Observers" to "Deep Facilitators"

Teachers play an irreplaceable key role in the process of digital picture books supporting deep learning in young children. Faced with a digital learning environment, teachers should transform from passive users of technology or simple order maintainers to observers, supporters, and facilitators of young children's deep learning[5]. Before reading, teachers should carefully select digital picture books, evaluate their content value and the age-appropriateness of interactive design, and anticipate points for in-depth discussion. During reading, teachers should guide young children to shift their attention from sensory stimulation to deep thinking about the meaning of the story through heuristic questioning. After reading, teachers should organize extension activities to help young children connect the experiences in the picture book with their own lives and encourage them to express their understanding and imagination through group discussions, role-playing, or digital creation. The wise guidance of teachers serves as the core bridge connecting the advantages of technology with the deep development of children.

4.4. Constructing a Closed Loop of Evaluation and Design for Deep Learning

The scientific nature of practice cannot be separated from the support of evidence-based research. First, evaluation tools targeting the core elements of deep learning need to be constructed to replace the current single evaluation system that overly relies on interest and knowledge assessment. The evaluation content should cover young children's problem-solving, creative expression, critical thinking, and cooperative communication during the application of digital picture books. Second, the results of evaluation should feed back into the design and teaching improvement of digital picture books. Developers should optimize interactive design based on in-depth observations of young children's learning processes to endow it with stronger cognitive guidance functions. For example, designing interactive tasks with adjustable difficulty levels, providing prompts that promote metacognition[6], or creating digital spaces that support collaborative creation among children. In the future, digital picture books should strive to form a virtuous closed loop of "design-application-evaluation-optimization" through the deep integration of technology and teaching, continuously promoting the occurrence and development of deep learning among young children.

Funding

Project of the subject: Jilin Province Primary and Secondary School Teaching Research Association's 2025 Special Project on College Students' Research Topics " A Study on the Effect of Digital Picture Books in Supporting Young Children's Deep Learning" (Project No.: GHKT2025-0038)

Disclosure statement

The author declares no conflict of interest.

References

[1] Furenes M I, Kucirkova N, Bus A G, 2021, A Comparison of Children's Reading on Paper Versus Screen: A Meta-Analysis. Review of Educational Research, 91(4), 483-517.

[2] Wu XY, 2024, Exploring the effects of digital technology on deep learning: a meta-analysis. Education and Information Technologies, 29(1): 425-458.

[3] Brown S, Hao L, Zhang R, 2025, "The dinosaurs are so loud; they can't sleep. Zzzz": Supporting emergent bilingual children's reading comprehension through digital literacies. Journal of Early Childhood Literacy, 25(1): 81-108.

[4] Yan Y, Zheng Y, Ye X, 2025, The impact of IVR-ADDIE-based digital storytelling teaching mode on students' self-regulation ability and self-efficacy. Education and Information Technologies, 30(5): 6141-6162.

[5] Sylla C, Pereira ISP, Coutinho CP, et al., 2015, Digital manipulatives as scaffolds for preschoolers' language development. IEEE Transactions on Emerging Topics in Computing, 4(3): 439-449.

[6] Nilsen M, 2024, Digital childhoods and multilingual identities: Preschool children's interactions with a picture book app. Children & Society.