INNOVATING LITERACY: AI-POWERED TOOLS AND STRATEGIES TO ADDRESS FOUNDATIONAL LEARNING GAPS

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As the world grapples with persistent foundational learning gaps, particularly in early-grade reading and comprehension, artificial intelligence (AI) is emerging as a transformative force in education. Across continents, educators are leveraging AI-powered platforms and innovative technologies to personalize instruction, boost engagement, and accelerate literacy gains that offer hope for millions of children at risk of falling behind.

Internationally, AI is redefining how foundational literacy is taught and assessed. Interactive learning technologies today provide immediate feedback on student capabilities while adapting lesson materials and pace to individual learning styles. These systems allow learners to master reading concepts at their own speed, providing immediate feedback and targeted support. Intelligent tutoring systems, such as Carnegie Learning, offer personalized guidance and adapt to diverse learning styles, helping students overcome specific reading challenges. Meanwhile, AI-driven assistive technologies like speech recognition and automated text-to-speech empower students with disabilities to participate more fully in classroom activities, making literacy instruction more inclusive than ever before (University of San Diego, 2025).

AI is also streamlining administrative tasks, automating grading and assessment, and providing teachers with actionable data on student progress. This data-driven approach enables educators to identify learning gaps quickly and adjust instruction accordingly, maximizing the impact of their interventions (University of San Diego, 2025).

Across Asia, the integration of AI in early-grade literacy is accelerating, with countries piloting innovative solutions to address unique linguistic and cultural challenges. In Singapore, for example, the Luka AI Reading Robot is being deployed in preschools to support children's reading in their mother tongue languages like Chinese, Malay, and Tamil. Luka serves as an interactive, multilingual reading companion, reading picture books aloud as children flip through pages at their own pace. Teachers can personalize sessions by recording their own voices, making the tool adaptable even when educators are not fluent in all target languages. This approach not only fosters independent reading but also bridges resource gaps in second-language instruction, promoting both literacy and technological fluency among young learners (HundrED, 2025).

Similarly, a systematic review of technology in ESL (English as a Second Language) primary education across the region highlights the efficacy of digital storytelling, augmented reality, and multimedia platforms in boosting reading comprehension and vocabulary. Students and teachers report increased motivation and engagement, though challenges remain in infrastructure and teacher training (Alneyadi et al., 2023).

In the Philippines, the urgency to address foundational reading gaps has prompted a wave of tech-enabled interventions. National assessments and international benchmarks like PISA have underscored the need for systemic support in literacy. Responding to this, the Department of Education (DepEd) and partners have rolled out AI-powered tools such as Microsoft's Reading Progress, which is revolutionizing how teachers assess and support early-grade readers.

In Bais City, Negros Oriental, the adoption of Reading Progress has yielded remarkable results: students previously categorized as non-readers or at frustration level made significant gains, with many advancing to higher reading levels within just three months. The tool automates reading assessments, reducing teachers' workload from 16

hours to just two hours, and freeing up time for lesson planning and individualized support. Since 2022, Reading Progress has assessed 14,000 learners across 60 schools, and its reach is expanding nationwide to potentially benefit 27 million students and nearly a million teachers (Microsoft Asia News Center, 2025).

Alongside Reading Progress, the Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH) is piloting the Technology-Enabled Early-Grades Reading Interventions (TEEGRI) project. In partnership with the Reading Association of the Philippines, TEEGRI aims to develop and scale effective, technology-driven reading interventions, building capacity in both public and private schools to nurture able readers and adept learners.

However, challenges remain. Key recurring issues include technological barriers, the need for reliable digital foundations, and sustained professional growth opportunities for educators. Ensuring equitable access to AI-powered tools is critical, especially for disadvantaged communities (Alneyadi et al., 2023).

The convergence of AI and education is opening new pathways to close foundational learning gaps. From Germany's efforts to foster AI literacy among disadvantaged children (TUM Center for Educational Technologies, 2025), to Southeast Asia's multilingual reading robots and the Philippines' nationwide AI-powered assessments, the evidence is clear: when thoughtfully implemented, technology can be a powerful equalizer in the quest for universal literacy.

As more countries and communities embrace AI-driven solutions, the focus must remain on responsible use, teacher empowerment, and continuous evaluation. With the right strategies, every child regardless of background, can become a confident, curious, and capable reader.

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