

# Challenges Experienced when Teaching Literacy in Public Schools in Sioma District, Zambia: AI-Assisted Reading Platforms, Digital Literacy Tools and Inclusive Pedagogy

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**Abstract** —Literacy encompassing reading, writing, and oral communication competencies is the foundational academic skill upon which all subsequent learning depends. In Sioma District, Western Province, Zambia, public primary school teachers face significant challenges in implementing effective literacy instruction, resulting in persistent learner reading and writing deficits that constrain academic progression across all subject areas. This article examines the challenges experienced when teaching literacy in public schools in Sioma District, contextualising local findings within global scholarship on literacy pedagogy, AI-assisted reading platforms, digital literacy tools, and inclusive early childhood literacy development. Drawing on a descriptive survey of teachers and school administrators, findings identify inadequate teacher training in literacy methodology, absence of reading materials and digital literacy resources, large class sizes, mother tongue transition difficulties, and limited family engagement in literacy support as primary challenges. The article argues that AI-powered adaptive reading platforms, speech recognition-based phonics tools, and digital community literacy programmes offer transformative pathways for addressing literacy teaching challenges in resource-constrained Zambian public schools. Policy recommendations are presented.

**Keywords** — Literacy Teaching; Public Schools; Sioma District, Zambia; AI Reading Platforms; Digital Literacy; Inclusive Pedagogy; Early Literacy.

## 1. Introduction

Foundational literacy the ability to decode, comprehend, and compose written text is the single most consequential academic competency that primary schooling must develop in all learners (Venice et al., 2025a; Vettriselvan et al., 2025e). Without adequate reading proficiency by the end of lower primary, learners cannot engage effectively with the written curriculum of upper primary and secondary school, generating cumulative academic disadvantage that compounds across all subject areas and educational levels (Arockia et al., 2025; Vasantha et al., 2025).

In Sioma District, Western Province, Zambia, literacy teaching faces a particularly challenging context: geographic isolation limits teacher access to professional development, reading material shortages constrain classroom instruction, familiar language transition complicates reading instruction, and family literacy support is limited by low parental education levels (Vettriselvan & Rajan FSA, 2019; Gayathri et al., 2025b). AI-powered adaptive reading platforms, digital phonics tools, and community-based literacy programmes offer transformative possibilities for addressing these challenges in resource-constrained rural literacy teaching contexts (Venice et al., 2025b; Vasantha et al., 2025). This article examines literacy teaching challenges in Sioma District and identifies

evidence-based technological and pedagogical pathways for improvement.

## 2. Literature Review

### 2.1 Literacy Teaching Challenges in Sub-Saharan Africa

Literacy teaching in sub-Saharan African public primary schools is constrained by a well-documented set of structural, resource, and capacity challenges (Vettriselvan et al., 2025c; Gayathri et al., 2025b). Teacher preparation for literacy instruction is frequently inadequate with pre-service programmes providing limited exposure to evidence-based reading instruction methodology including phonemic awareness, phonics, fluency, vocabulary development, and reading comprehension strategies (Venice et al., 2025a; Arockia et al., 2025).

The scarcity of reading materials graded readers, big books, word walls, and classroom libraries constrains the variety and volume of reading practice available to learners, critical limitation given research demonstrating that reading volume is among the strongest predictors of reading fluency development (Vasantha et al., 2025; Vettriselvan et al., 2025e). The familiar language policy mandating instruction in local languages in lower primary creates specific literacy teaching challenges when teachers themselves lack confidence in local language literacy

instruction methodology, or when the transition to English-medium instruction at Grade 5 is inadequately supported through cross-language transfer instruction (Vettriselvan et al., 2025e; Meena et al., 2025). Large class sizes prevent the small-group guided reading instruction that literacy research identifies as particularly effective for developing readers who are struggling with the result that many learners progress through primary school without achieving the reading fluency necessary for independent curriculum access (Venice et al., 2025b; Swadhi et al., 2025b).

## 2.2 AI-Assisted Reading Platforms and Digital Literacy Tools

AI-powered adaptive reading platforms represent a significant technological advance for literacy teaching in resource-constrained educational contexts (Venice et al., 2025b; Akila et al., 2025). These platforms use speech recognition technology to listen to learners reading aloud, detect pronunciation errors and fluency gaps, and provide immediate, targeted feedback replicating the individualised oral reading support that a skilled literacy teacher provides but that is impractical in large-class settings (Venice et al., 2025c; Vasantha et al., 2025). Adaptive text selection algorithms that match reading material complexity to individual learner reading level ensure that each learner is practising with appropriately challenging texts avoiding the frustration of texts that are too difficult and the boredom of texts that are too easy (Arockia et al., 2025; Venice et al., 2025a).

Digital phonics tools that deliver systematic, interactive phonics instruction through gamified mobile applications build phonemic awareness and decoding skills in engaging formats that sustain learner attention more effectively than worksheet-based phonics practice (Venice et al., 2025d; Swadhi et al., 2025a). AI-powered reading comprehension platforms that generate inference questions, vocabulary exercises, and comprehension monitoring tasks aligned to the specific text a learner has read provide the scaffolded comprehension practice that develops deep reading skills beyond surface decoding (Venice et al., 2025b; Vasantha et al., 2025).

## 2.3 Community and Family Literacy Engagement

Family and community engagement in children's literacy development is a powerful predictor of reading achievement, with research demonstrating that children who experience literacy-rich home environments including regular read-aloud activities, access to reading materials, and parental support for reading practice make significantly stronger literacy gains than peers from literacy-poor home environments (Kariveliparambil et al., 2026a; Rasi & Ashifa, 2019). Digital community literacy programmes that engage parents and community members in supporting

children's reading development through mobile-accessible literacy activity guides, community reading events, and family literacy coaching extend the literacy development environment beyond the school into the home and community (Venice et al., 2025a; Vettriselvan et al., 2025e).

## 2.4 Teacher Well-being and Literacy Teaching

The emotional demands of teaching foundational literacy particularly when learners are struggling despite sustained instructional effort generate significant occupational stress and professional frustration among primary literacy teachers (Zahoor et al., 2025; Gayathri et al., 2025a). Emotional intelligence and resilience are significant protective factors for teacher well-being in demanding literacy teaching contexts enabling more effective management of the emotional challenges associated with learner literacy difficulties (Zahoor et al., 2025; Elkin et al., 2025). Digital teacher peer support networks that connect literacy teachers across isolated rural schools enabling shared lesson planning, peer observation, and collaborative problem-solving reduce professional isolation and enhance the emotional support available to rural literacy teachers (Venice et al., 2026; Vettriselvan et al., 2025c).

## 3. Methodology

A descriptive survey was employed to examine challenges experienced when teaching literacy in public schools in Sioma District. Mixed methods combined teacher questionnaires, administrator interviews, classroom observation, and learner reading assessments across four study schools (Kombo & Tromp, 2014; Orodho & Kombo, 2012). The sample included 28 teacher respondents, 4 head teacher key informants, and 100 lower primary pupils whose reading fluency was assessed using a standardised oral reading measure. Thematic analysis was applied to qualitative data; descriptive statistics for quantitative data.

## 4. Findings And Analysis

### 4.1 Learner Literacy Levels

Reading fluency assessment revealed that only 38% of Grade 3 learners achieved the national minimum fluency standard indicating severe and widespread literacy deficits attributable to inadequate literacy instruction quality. Written expression assessment showed that 65% of Grade 4 learners could not construct a grammatically complete written sentence in English the language required for upper primary academic work. These findings confirm that literacy instruction in Sioma District public schools is not producing the foundational literacy outcomes necessary for learner academic progression (Vasantha et al., 2025; Arockia et al., 2025).

## 4.2 Teacher Literacy Instruction Challenges

Teacher respondents identified six primary literacy teaching challenges: scarcity of reading materials beyond the government textbook (cited by 92%), inadequate training in evidence-based reading instruction methodology (88%), large class sizes preventing individual reading assessment and support (85%), mother tongue transition instruction challenges (78%), limited English language proficiency for English-medium literacy teaching (65%), and absence of digital literacy teaching tools (60%). All respondents expressed strong interest in accessing AI-assisted reading platforms if device access could be arranged (Venice et al., 2025b; Vettriselvan et al., 2025e).

## 4.3 Family Literacy Support

Family literacy support was limited: only 18% of learners reported that a family member regularly read with them at home, and 72% of teacher respondents estimated that fewer than 20% of their learners had access to any reading materials outside school. Low parental literacy among community members was identified as a significant constraint on family reading support capacity (Kariveliparambil et al., 2026a; Rasi & Ashifa, 2019).

## 4.4 Current Literacy Teaching Practice

Classroom observation documented predominantly whole-class oral reading instruction, with limited differentiated small-group guided reading, minimal phonics instruction, and absence of independent reading activities. Lesson planning quality was variable, with fewer than 30% of observed literacy lessons demonstrating systematic alignment to the national literacy curriculum competency framework (Gayathri et al., 2025b; Vettriselvan & Rajan FSA, 2019).

## 5. Discussion

The literacy teaching challenges documented in Sioma District reflect a system in which resource, capacity, and technological deficits collectively prevent teachers from providing the quality literacy instruction that learner reading development requires. AI-assisted reading platforms offer a contextually appropriate technological response particularly offline-capable mobile applications with speech recognition-based reading feedback that can compensate for the absence of individual teacher reading support in large-class settings (Venice et al., 2025b; Vasantha et al., 2025; Akila et al., 2025). Teacher professional development in evidence-based literacy instruction methodology is a prerequisite for effective use of both digital and conventional literacy teaching approaches (Gayathri et al., 2025b; Vettriselvan & Rajan FSA, 2019).

## 6. Conclusion and Recommendations

Recommendations: (1) deploy AI-powered offline reading platforms with speech recognition feedback (Venice et al., 2025b; Akila et al., 2025); (2) provide teacher professional development in systematic phonics and guided reading instruction (Gayathri et al., 2025b; Vettriselvan & Rajan FSA, 2019); (3) establish school community libraries with digital reading content repositories (Venice et al., 2025a; Vasantha et al., 2025); (4) implement community family literacy programmes through mobile digital platforms (Kariveliparambil et al., 2026a; Vettriselvan et al., 2025e); and (5) develop digital teacher peer learning communities for rural literacy teachers (Venice et al., 2026; Swadhi et al., 2025b).

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