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Digital Storytelling as a Tool for Enhancing Reading Comprehension among Grade Four English First Additional Language Learners in Vhembe Cluster

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ABSTRACT

South African Grade 4 learners face persistent challenges in reading comprehension as they transition into English First Additional Language (EFAL) instruction, a problem intensified in rural schools where technological, linguistic, and pedagogical resources are limited. Although digital storytelling (DST) is widely recognised internationally as a promising multimodal literacy strategy, its application within resource-constrained EFAL classrooms remains significantly under-examined. This study addresses this gap by investigating how teachers in rural Limpopo understand, implement, and experience DST. Using an interpretive qualitative case study design, data were generated through semi-structured interviews, non-participant classroom observations, and teacher reflection journals, enabling a rich, triangulated understanding of pedagogical practices. Thematic analysis revealed that DST enhances learner engagement, vocabulary development, and reading comprehension when supported through guided teacher mediation, visual scaffolding, oral explanation, and culturally relevant narratives. To advance the field, this study presents the first DST comprehension model specifically designed for rural EFAL contexts, illustrating how multimodal and sociocultural processes intersect under conditions of infrastructural scarcity. The model demonstrates that adequate comprehension is driven not by technology alone but by

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ARTICLE INFO

Received: 8 October 2025 | Revised: 26 November 2025 | Accepted: 8 December 2025 | Published Online: 12 February 2026
DOI: https://doi.org/10.30564/fls.v8i2.12383

CITATION

Mulaudzi, I.C., Lambani, M.N., Nephawe, F.T., 2026. Digital Storytelling as a Tool for Enhancing Reading Comprehension among Grade Four English First Additional Language Learners in Vhembe Cluster. Forum for Linguistic Studies. 8(2): 19–30. DOI: https://doi.org/10.30564/fls.v8i2.12383

strategic teacher facilitation and contextual adaptation. Findings further show that while DST holds strong pedagogical potential, its successful use depends on teacher confidence, digital self-efficacy, and access to low-tech, locally relevant resources. Strengthening teacher professional development, improving rural digital equity, and providing simplified multimodal teaching materials are essential steps toward scaling DST as a viable and context-appropriate comprehension strategy in rural South African classrooms.

Keywords: Digital Storytelling; EFAL; Reading Comprehension; Rural Literacy; Multimodal Pedagogy

1. Introduction

Reading comprehension remains one of the most persistent barriers to learning for South African Grade 4 learners as they transition into English First Additional Language (EFAL) instruction. While the national literacy crisis is well documented, as demonstrated by the PIRLS 2021 findings, which placed South African Grade 4 learners among the lowest-performing globally[1], the challenge is particularly acute in rural settings, where learners encounter English for the first time as the primary medium of instruction without adequate linguistic or pedagogical support. However, although broad national factors shape the crisis, the specific problem addressed in this study concerns the limited availability of effective, context-responsive pedagogical models to support EFAL reading comprehension in rural classrooms. In particular, teachers in the Vhembe Cluster lack structured guidance on integrating multimodal, digitally mediated strategies that scaffold comprehension for linguistically diverse learners.

These difficulties are intensified by rural schooling conditions characterised by overcrowded classrooms, limited access to print and digital resources, and multilingual learner populations whose home languages differ from the language of learning and teaching. Although the Curriculum and Assessment Policy Statement (CAPS) advocates learner-centred, multimodal approaches, including the integration of digital tools to support reading, most teachers in rural Limpopo receive minimal training to enact these expectations. As a result, existing digital or formative literacy practices are implemented inconsistently, often relying on traditional, text-heavy methods that do not adequately support intermediate-phase EFAL learners. In this context, digital storytelling emerges as a particularly relevant strategy because it directly addresses Limpopo's resource constraints through low-tech multimodal scaffolding that supports comprehension even when digital access is limited. The gap, therefore, is not simply infrastructural; it is pedagogical. Teachers need practical, theoretically grounded strategies for using digital tools to enhance comprehension in resource-constrained EFAL classrooms.

Within this landscape, digital storytelling (DST), which integrates narrative, images, audio, and simple digital tools, offers a potentially powerful approach for making reading more meaningful, culturally relevant, and cognitively accessible. International studies consistently demonstrate that DST supports vocabulary development, narrative understanding, and deeper comprehension through multimodal processing. Yet despite this growing body of global evidence, there is no empirical research documenting how rural Grade 4 EFAL teachers in South Africa conceptualise, adapt, or implement digital storytelling in their classrooms. The absence of such research limits the country's ability to develop contextually grounded digital literacy models that respond to the realities of rural pedagogy. This study addresses this gap by examining teachers' understandings and classroom use of DST as a tool for strengthening reading comprehension in the Vhembe Cluster.

Structure of the Paper

The remainder of this paper is organised as follows: Section 2 presents the literature review, highlighting global, African, and South African scholarship on digital storytelling and reading comprehension. Section 3 outlines the integrated theoretical framework underpinning the study. Section 4 describes the methodological approach, including sampling, data generation, and analytic procedures. Section 5 reports the findings supported by direct teacher accounts and observational evidence. Section 6 offers a critical discussion linking the findings to global DST debates and rural South African realities. Section 7 concludes the paper with key implications, recommendations, and directions for further

research.

2. Literature Review

Digital storytelling (DST) has gained international recognition as a powerful multimodal pedagogy that enhances language learning, reading comprehension, and learner engagement across diverse educational contexts. Defined broadly as the combination of narrative, audio, images, and simple digital tools to create and interpret stories, DST enables learners to construct meaning through integrated verbal and visual channels [2,3]. Unlike traditional print-based reading tasks, digital stories stimulate multiple modes of representation, sound, imagery, movement, and text, which together foster deeper comprehension, memory retention, and inferential reasoning [4]. For learners acquiring English as an additional language, these multimodal supports reduce cognitive load and provide contextual cues that facilitate understanding of unfamiliar vocabulary and narrative structure [5].

2.1. Global Perspectives on Digital Storytelling and Reading Comprehension

A substantial body of global research demonstrates that DST significantly improves reading comprehension in English as a Second/Foreign Language (ESL/EFL) contexts. For example, Yang and Wu [3] found that DST enhances learners' ability to summarise, predict, and interpret story events by providing sustained visual scaffolding. Similarly, Yang and Wu, Sylvester and Greenidge [3,6] reported that digital narratives improved inferencing, sequencing, and story retelling skills among primary learners. Hafner [7] showed that creating and analysing digital stories builds multimodal awareness and deepens comprehension by forcing learners to negotiate meaning across text, image, and audio. Recent research further confirms that multimodal narrative construction strengthens literacy, metacognitive awareness, and learner identity in digital contexts [8]. Studies in Turkey, Brazil, Korea, and the United States likewise demonstrate that DST promotes vocabulary acquisition, narrative understanding, and emotional engagement, three components strongly associated with reading comprehension [9,10]. Collectively, these studies highlight three consistent benefits of DST: cognitive scaffolding through dual coding of words and visuals; affective engagement, motivating learners to persist in reading tasks; and cultural relevance, linking stories to learners' lived experiences.

2.2. Digital Storytelling in African and South African Contexts

While global evidence is extensive, African DST research remains limited. Studies in Ghana and Kenya show that DST supports multilingual learners by integrating culturally grounded narratives, improving comprehension, and identity affirmation [11]. In South Africa, multimodal literacy scholarship highlights how combining visual and verbal modes strengthens EFAL learners' interpretive abilities [12]. DST is increasingly recognised as a flexible tool for bridging linguistic diversity, strengthening vocabulary, and supporting contextualised reading comprehension in the Intermediate Phase [13]. However, most African and South African studies have been conducted in relatively better-resourced environments, leaving rural contexts under-researched.

South African EFAL classrooms, particularly in rural Limpopo, face distinct challenges including multilingualism, limited exposure to English, infrastructure shortages, and traditional, text-heavy instructional practices [14]. Although CAPS encourages multimodal and learner-centred approaches, teachers often lack the training and resources needed to operationalise these expectations. Emerging studies suggest that DST could bridge these gaps, but its uptake and classroom enactment remain highly uneven.

2.3. Critiques and Limitations of Digital Storytelling

Despite its documented benefits, DST is not without limitations. Recent scholarship highlights that DST may exacerbate the digital divide when communities lack stable electricity, devices, or data, conditions prevalent in rural African settings [15]. A 2025 systematic review of DST interventions with young adults of colour found that although DST improved knowledge and attitudes, it yielded mixed outcomes for long-term behavioural or literacy change, suggesting that multimodal exposure alone does not guarantee deep learning [16]. Likewise, Kim et al. [8] caution that without structured mediation, learners may engage superficially with digital artefacts, limiting cognitive transfer. Teachers

in low-resource contexts also report that DST production is time-intensive, technically demanding, and challenging to sustain without systematic support [17]. These critiques reveal that DST is not a universal solution; its effectiveness hinges on teacher facilitation, contextual adaptation, and infrastructural reliability—all core issues in rural South African EFAL classrooms.

2.4. The Need for Contextually Grounded DST Research in Rural EFAL Classrooms

Despite the global evidence on DST, no empirical study has examined how rural South African Grade 4 EFAL teachers conceptualise, adapt, and implement DST under conditions of technological scarcity. Rural teachers operate within constraints such as inconsistent or absent digital infrastructure, limited professional development in digital pedagogy, multilingual classrooms requiring additional linguistic scaffolding, and insufficient curriculum support for multimodal strategies.

Global DST models assume technological readiness that is often absent in rural Limpopo. While international literature emphasises digital sophistication, rural teachers must rely on simplified, low-cost, hybrid multimodal strategies that remain undocumented in scholarship. This study, therefore, addresses a critical knowledge gap by investigating DST practice in one of South Africa's most underserved educational contexts.

2.5. Conceptual Threads Informing This Study

This study is informed by three intersecting bodies of scholarship that together frame the pedagogical and theoretical significance of digital storytelling (DST) in rural EFAL classrooms. First, Multimodal Literacy Theory provides the foundational lens through which DST is understood as a meaning-making process that draws on multiple modes, visual, auditory, oral, and written. According to Scott and Hargreaves [18], multimodal approaches allow learners to engage with texts through layered representations that reinforce understanding. For EFAL learners who often struggle with English-only print texts, this simultaneous engagement with different modes provides crucial scaffolding that supports vocabulary development, narrative interpretation, and comprehension.

Second, the study draws on Culturally Responsive Pedagogy, which highlights the value of incorporating learners' cultural contexts, lived experiences, and linguistic repertoires into instruction. DST aligns naturally with this perspective because it allows teachers to integrate community-based images, locally resonant themes, and learners' home languages into the construction and interpretation of stories. As Mavhungu and Netshandama [19] argue, such culturally grounded pedagogies strengthen identity, increase participation, and enhance comprehension by connecting new knowledge to familiar contexts. This lens is especially relevant in rural South African classrooms, where learners navigate diverse linguistic and cultural backgrounds.

Third, literature on Second-Language Reading Development underscores the role of digital media in supporting learners through vocabulary cues, pronunciation modelling, and narrative scaffolding that may not be available in traditional print-based tasks. Mensah [11] and Zhan [20] emphasise that digital tools can mitigate linguistic barriers by providing multimodal cues that help learners decode, interpret, and retain information more effectively.

Together, these three conceptual strands, multimodal literacy, cultural responsiveness, and second-language reading development, position DST as a promising, though still theoretically underdeveloped, approach for strengthening EFAL reading comprehension in rural contexts. They also highlight the importance of designing DST practices that are contextually grounded, pedagogically intentional, and responsive to the realities of low-resource learning environments.

Overall, the reviewed studies demonstrate the pedagogical value of DST but also highlight limitations in current scholarship, especially in rural, multilingual African contexts. These gaps justify the need for a theoretically grounded model that accounts for multimodal, sociocultural, and contextual adaptation processes under conditions of scarcity. The following section, therefore, introduces the integrated theoretical framework guiding this study.

3. Theoretical Framework

This study draws on two complementary yet distinct theoretical perspectives, Vygotsky's Social Constructivist Theory and Mayer's Multimedia Learning Theory (MLT), to examine how digital storytelling (DST) enhances reading

comprehension among Grade 4 EFAL learners in rural South Africa. While previous studies often apply these theories descriptively, this research uses them critically and integratively to conceptualise how multimodal digital narratives function in contexts marked by linguistic diversity, technological scarcity, and uneven pedagogical support.

3.1. Vygotsky's Social Constructivist Theory: Meaning-Making through Mediation

Vygotsky[21] positions learning as a socially mediated process in which knowledge is co-constructed through interactions with teachers, peers, and culturally shaped tools. In rural EFAL classrooms, where learners encounter English with limited exposure and must navigate unfamiliar vocabulary, structures, and concepts, digital storytelling (DST) functions as an important mediational tool that helps bridge the gap between learners' everyday experiences and the academic demands of English texts. Vygotsky's theory offers three core mechanisms that illuminate the pedagogical value of DST in such contexts.

First, mediation refers to the use of cultural tools to support thinking and meaning-making. Within DST, digital elements such as images, voiceovers, background sounds, and short video clips serve as powerful mediational tools. These multimodal components create additional entry points for learners, helping them decode unfamiliar words, grasp difficult concepts, and connect the story to their lived realities. Second, scaffolding within the Zone of Proximal Development (ZPD) occurs when teachers guide learners through interpreting and retelling digital stories. Through strategic questioning, pausing, prediction prompts, and clarifications, teachers enable learners to reach comprehension levels that would not be attainable through print-based texts alone. This guided interaction is especially critical for EFAL learners who require explicit support to construct meaning in a second language.

Third, social meaning-making emerges through group-based DST activities collectively. These collaborative engagements allow learners to draw on home languages, shared cultural narratives, gestures, and peer explanations to enhance understanding. In multilingual rural contexts, such social processes play a crucial role in making English texts accessible and meaningful.

Critically, while Vygotsky's[21] sociocultural theory provides a strong foundation for understanding mediated learning, it does not fully consider how visual and auditory modes contribute to comprehension. DST extends Vygotsky's framework by introducing multimodal mediation, where meaning is constructed not only through language and interaction but also through complementary sensory modes. This positions DST as a theoretically enriched extension of sociocultural learning, particularly relevant for low-resource EFAL classrooms.

3.2. Mayer's Multimedia Learning Theory: Dual-Channel Cognitive Processing

Mayer's Multimedia Learning Theory (MLT) explains that learners process information through two primary channels, verbal and visual, and that learning is enhanced when these channels operate together in complementary ways. Digital storytelling (DST) aligns strongly with MLT's core principles: dual coding, where narration paired with imagery strengthens comprehension; coherence, where simplified visuals help reduce cognitive load; and contiguity, where synchronised audio and visuals support deeper integration of meaning. However, traditional applications of MLT assume that learners have access to high-quality digital infrastructure and polished multimedia resources.

This study extends MLT by examining how its principles operate in low-tech, resource-constrained rural classrooms, where teachers often adapt multimedia elements using smartphones, offline applications, printed screenshots, or hybrid paper-digital formats. The findings demonstrate that the cognitive benefits proposed by MLT, particularly enhanced comprehension through multimodal integration, can still emerge even when DST is delivered through simplified or improvised means. Thus, the study not only applies MLT but also challenges its implicit assumptions about technology-rich environments, showing that effective multimodal learning can occur in rural EFAL settings without sophisticated digital tools.

3.3. Integrating Vygotsky and Mayer: A Contextualised Multimodal Learning Model

Although Braun and Clarke[22] originate from different paradigms, sociocultural and cognitive, their integration provides a powerful lens for analysing DST in EFAL classrooms

(**Table 1**). Their theoretical intersection rests on the shared idea that meaning-making is enhanced when learners engage with multiple forms of representation. Yet, each theory fills gaps left by the other:

Table 1. Integration of Vygotsky's and Mayer's Theories through DST.

Vygotsky (Social)	Mayer (Cognitive)	Integration through DST
Focuses on interaction & cultural tools	Focuses on internal cognitive processing	DST supports both social collaboration & cognitive dual-channel processing
Explains scaffolding but not multimodal input	Explains multimodality but not cultural mediation	DST uses visuals & narration grounded in learners' culture and languages
Emphasises language as mediational tool	Emphasises visual-verbal integration	DST blends language, visuals, sound, gesture

DST therefore becomes the point of convergence: A multimodal, socially mediated practice in which learners co-construct meaning using diverse representational tools.

3.4. The Digital Storytelling Comprehension Model (DSCM): Contribution of This Study

To address the absence of integrated theoretical models suited to rural EFAL digital pedagogy, this study proposes the Digital Storytelling Comprehension Model (DSCM) (**Figure 1**), which synthesises Vygotsky's[21] sociocultural theory and Braun and Clarke's[22] Multimedia Learning Theory to explain how DST supports comprehension in under-resourced classrooms. The DSCM comprises four interrelated processes. First, Multimodal Mediation draws from both theorists by showing how images, audio, and narration scaffold comprehension, reduce linguistic barriers, and provide multiple entry points for meaning-making. Second, Collaborative Meaning-Making, grounded in Vygotsky[21], highlights how learners interpret and co-construct stories through peer dialogue, code-switching, shared cultural knowledge, and guided teacher mediation. Third, Cognitive Integration, derived from Braun and Clarke[22], explains how the coordination of visual and verbal channels enhances memory, sequencing, inferencing, and vocabulary retention. Fourth, Contextual Adaptation extends both theories by recognising that rural teachers frequently use low-tech, hybrid, or improvised DST methods that incorporate local languages, cultural narratives, community images, and available resources. Together, these four processes demonstrate how DST can effectively support comprehension even in technologically constrained environments, offering a context-responsive theoretical model for rural EFAL literacy development. This integrated model addresses theoretical gaps by explaining how and why DST works in low-resource EFAL classrooms—a context underrepresented in global DST research.

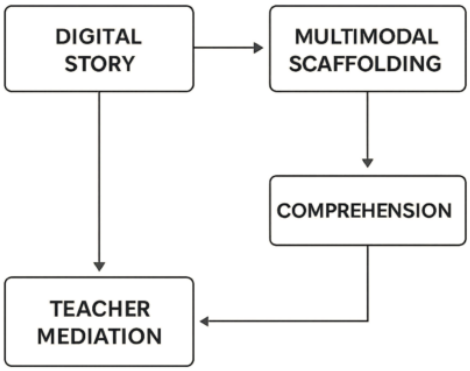

Figure 1. Digital Storytelling Comprehension Model (DSCM).

This model integrates Vygotsky's[21] sociocultural theory and Mayer's multimedia learning principles to explain how digital storytelling enhances reading comprehension in rural EFAL classrooms. The DSCM outlines a sequential process of multimodal mediation, collaborative meaning-making, cognitive integration, and contextual adaptation, culminating in improved learner comprehension and literacy outcomes.

The integrated framework is particularly relevant to rural South African EFAL classrooms because it enables a holistic analysis of digital storytelling (DST) as both a cognitive and sociocultural practice. It allows the study to conceptualise DST not merely as a technical intervention but as a culturally mediated literacy practice embedded in learners' lived experiences. By combining Vygotsky's[21] focus on mediation and collaborative meaning-making with Braun and Clarke's[22] emphasis on multimodal cognitive processing, the framework enables the examination of how teachers' improvisation with low-tech digital tools aligns with broader learning processes. It also illuminates how multilingual learners draw on home languages, visual cues, and collaborative narration to construct meaning, thereby

extending traditional second-language reading theories that rely heavily on print-based comprehension. Notably, the integrated framework generates a theoretical contribution that is locally grounded, internationally relevant, and sensitive to the realities of digital inequality. Taken together, this model moves beyond descriptive theory use by offering a context-responsive lens that captures the unique pedagogical, cognitive, and cultural dynamics that shape digital storytelling in rural EFAL education.

4. Methodology

4.1. Research Design

This study employed an interpretive qualitative case study design to explore how Grade 4 EFAL teachers conceptualise and implement digital storytelling (DST) in rural Limpopo classrooms[23]. The qualitative case study approach was appropriate because it allowed for an in-depth examination of teachers' meaning-making and instructional practices within their natural school environments. Grade 4 was chosen because it marks the transition to English as the medium of instruction, making comprehension particularly challenging and requiring targeted pedagogical support. The design emphasised contextual understanding rather than generalisation, focusing on how DST is enacted under real classroom conditions.

4.2. Research Paradigm and Reflexivity

The study was underpinned by an interpretivist paradigm, which assumes that knowledge is constructed through human interaction and shaped by social context. To enhance transparency and reduce bias, the researcher maintained a reflexive journal throughout the study. Reflexive entries documented assumptions, reactions, and decision-making processes. For example:

> *"I realised I expected teachers to use DST with ease because I find it familiar—this assumption may obscure their real anxieties and challenges."* —Reflexive Journal, Week 1

> *"When the device froze during observation, I instinctively wanted to intervene. I had to remind myself that my role was to observe how teachers manage such realities."* —Reflexive Journal, Week 3

These reflexive practices strengthened the integrity and credibility of the interpretations.

4.3. Sampling Strategy

A purposive sampling strategy was used to select 8 EFAL teachers from 4 rural schools in the Vhembe District. Participants were chosen based on three inclusion criteria: they had at least 3 years' experience teaching EFAL, had at least basic exposure to digital tools, and were willing to participate in semi-structured interviews, classroom observations, and reflective journaling. The adequacy of the sample was guided by the principle of information power, which considers the relevance and richness of the sample relative to the study's aim, specificity, theoretical grounding, and the quality of participants' contributions. Guided by this principle, data collection continued until saturation was reached, that is, when no new insights or patterns emerged from the interviews, observations, or journals. This sampling approach ensured that the study generated sufficiently rich and contextually grounded data to explore teachers' conceptualisations and use of digital storytelling in rural EFAL classrooms.

4.3.1. Data Generation Methods

Three complementary data-generation techniques were used to strengthen triangulation and deepen understanding:

4.3.2. Semi-Structured Interviews

Two rounds of interviews explored teachers' conceptualisations of DST, experiences, challenges, and perceptions of learner engagement. Interviews were audio-recorded, transcribed verbatim, and member-checked to ensure accuracy.

4.3.3. Classroom Observations

Two EFAL lessons per teacher were observed to capture real-time use of DST, multimodal scaffolding, and contextual constraints such as electricity interruptions and device malfunction. Field notes documented instructional processes and learner behaviour.

4.3.4. Reflection Journals

Teachers kept short reflection journals over two weeks, offering spontaneous insights into their ongoing experiences with DST. These journals provided a more naturalistic un-

derstanding of teachers' evolving thoughts and challenges.

4.4. Data Analysis

Data were analysed using reflexive thematic analysis as outlined by Braun and Clarke[22,24]. The process began with extensive familiarisation with the interview transcripts, teacher journals, and observation notes, followed by initial open coding to capture meaningful patterns across the dataset. These codes were then clustered into both inductive and deductive themes: inductive themes emerged directly from teachers' expressions, for example, statements such as *"if the phone dies, the lesson dies"*, while deductive themes were informed by the study's theoretical lenses, including multimodal mediation and sociocultural scaffolding. Theme categories were refined iteratively to ensure conceptual clarity and analytic depth. Throughout this process, triangulation across interviews, observations, and journals strengthened the credibility of the findings by confirming recurring patterns across sources. NVivo software was used to support systematic coding, organisation, and retrieval of data, enabling a rigorous and transparent analytic process.

4.5. Trustworthiness

Trustworthiness was ensured through a combination of credibility, dependability, confirmability, and transferability strategies. Credibility was strengthened through member checking, triangulation across interviews, classroom observations, and reflective journals, as well as ongoing peer debriefing to refine and verify emerging interpretations. Dependability was supported by maintaining a detailed audit trail that documented coding decisions, analytic shifts, and reflexive annotations throughout the research process, ensuring systematic and traceable methodological execution. Confirmability was enhanced through the researcher's use of reflexive journaling and periodic external review, both of which helped minimise researcher bias and ensured that findings were grounded in the participants' accounts rather than personal assumptions. Transferability was facilitated through rich, thick descriptions of rural school settings, allowing readers to evaluate the extent to which the findings may apply to similar educational contexts. Collectively, these strategies established the methodological rigour required for high-quality interpretive qualitative inquiry.

4.6. Ethical Considerations

Ethical approval for the study was obtained from the University of Venda Research Ethics Committee and the Limpopo Department of Education. Participation was entirely voluntary, and informed consent was secured from all teachers who took part in the study. Pseudonyms were used to safeguard participant identity, and all research procedures were designed to minimise disruption to teaching and learning activities. Data were stored on a password-protected, encrypted device accessible only to the researcher, ensuring strict confidentiality. In accordance with institutional ethics policy, all data will be securely retained for five years, after which they will be permanently destroyed. These measures ensured that the study complied with ethical principles of autonomy, privacy, confidentiality, and responsible data management.

5. Findings

The analysis produced five major themes that reveal how digital storytelling (DST) is understood, adapted, and enacted by rural EFAL teachers. These findings highlight not only the pedagogical potential of DST but also its context-specific constraints and variations. Teacher quotations illustrate the lived realities behind each theme:

5.1. Divergent and Sometimes Conflicting Understandings of DST

Teachers displayed inconsistent understandings of what constitutes DST. Some described DST as a multimodal, interactive practice ("*We mix pictures, sound, and reading so learners can learn in many ways*"). In contrast, others viewed it narrowly as the simple act of showing a video ("*Digital storytelling is just playing a video from YouTube*"). This conceptual fragmentation shaped the depth and quality of implementation.

5.2. DST Enhances Comprehension, But Only With Teacher Mediation

Lessons where teachers paused, questioned, and scaffolded the narrative produced strong comprehension gains ("*When I stop and ask questions, they explain better*"). Conversely, passive video-only use produced limited understand-

ing. This reflects the central role of teacher mediation over the technology itself.

5.3. Emotional Engagement Increases

DST generated high engagement, particularly among reserved learners ("*My shy ones spoke more during digital stories*"). Yet excessive excitement sometimes disrupted pacing ("*They get too excited and talk all at once*"). Engagement is, therefore, beneficial but requires structured facilitation.

5.4. Contextual Constraints Shape Low-Tech and Hybrid DST Practices

Teachers relied on improvised, low-cost methods due to infrastructure challenges. These included printed screenshots, audio clips, and basic phone displays ("*If my phone goes off, the lesson ends*"). DST practices, therefore, emerged as a blend of digital and non-digital tools adapted to rural realities.

5.5. Uneven Teacher Agency and Confidence

Some teachers creatively adapted DST to local contexts ("*I take photos from the village so learners see their own lives in the story*"), while others remained hesitant ("*I am scared because if something goes wrong, I will not know how to fix it*"). Teacher agency was shaped by digital familiarity, risk-taking disposition, and school-level support.

5.6. Synthesis of Findings

DST improved comprehension and engagement, but outcomes varied depending on teacher understanding, mediation, and contextual constraints. Rather than a technology-driven solution, DST emerged as a pedagogical process involving multimodal scaffolding, cultural relevance, and adaptive improvisation. These findings extend global DST scholarship by foregrounding low-tech, context-responsive multimodality as a legitimate pathway for literacy development (**Table 2**).

Table 2. Summary of Themes, Evidence, and Theoretical Links.

Theme	Illustrative Evidence (Teacher Quotes)	Interpretation	Theoretical Links
Divergent Understandings of DST	"*Digital storytelling is showing a video on YouTube.*"/"*It is pictures and sound together to help them learn.*"	Teachers' conceptual gaps shape the quality and depth of DST implementation.	Vygotsky: conceptual tools; Mayer: multimedia principles.
Mediation Determines Comprehension Gains	"*When I pause and ask questions, they explain better.*"	Comprehension improved only through guided meditation, not passive viewing.	Vygotsky: scaffolding/ZPD; Mayer: generative processing.
High Engagement with Classroom Management Risks	"*My shy ones spoke more.*"/"*They get over-excited and talk all at once.*"	DST increases affective engagement but requires structured management.	Socio-emotional mediation; cognitive load regulation.
Low-Tech and Hybrid Adaptations	"*If my phone dies, the lesson dies.*"/"*I use printed pictures when the power goes.*"	Rural teachers adapt DST creatively under infrastructural limitations.	Adaptive multimodality; contextual mediation.
Uneven Teacher Agency	"*I make stories using photos from the village.*"/"*I am scared if something goes wrong.*"	Teacher confidence determines how creatively DST is used.	Teacher identity: digital self-efficacy in socio-cultural contexts.

6. Discussion

This study investigated how Grade 4 EFAL teachers in rural Limpopo conceptualise and implement digital storytelling (DST) to support reading comprehension. While international research consistently positions DST as a transformative multimodal learning tool, this study's findings reveal a more complex picture shaped by contextual constraints, teacher agency, and cultural considerations. DST was not merely a technological intervention but a pedagogical process requiring mediation, adaptation, and improvisation.

6.1. Reconceptualising DST in Low-Tech Contexts

Unlike global DST models that assume access to stable devices, editing software, and connectivity[24], Maphalala and Mpofu[25], teachers in this study operated in technologically fragile environments. They therefore reconceptualised DST as a flexible, hybrid practice that mixes printed screenshots, mobile phone images, oral narration, and audio clips. This shows that DST can thrive even in low-tech classrooms, provided teachers creatively leverage multimodal resources.

6.2. The Central Role of Teacher Mediation

Comprehension gains were traced to teacher mediation rather than the digital artefacts themselves. Teachers who scaffolded learning through questioning, pausing, and guided retelling reported significantly better comprehension outcomes. These findings challenge dominant assumptions that multimedia features alone drive literacy improvement [22] (Mayer, 2021), emphasising the sociocultural nature of learning.

6.3. Engagement as Both Opportunity and Challenge

Teachers reported increased learner engagement, especially among timid learners who became more active when visuals were introduced. However, heightened excitement occasionally disrupted lesson flow, highlighting the need for structured facilitation to channel engagement into meaningful comprehension.

6.4. Contextual Constraints and Improvised Multimodality

Frequent electricity interruptions, limited device access, and data scarcity forced teachers to adopt improvised strategies. These low-tech adaptations contradict models like Robin [2] and Sadik [5], which present DST as a polished production process. This study shows that even partial or hybrid modalities can support comprehension, suggesting the need for broader, context-inclusive DST frameworks.

6.5. Teacher Agency and Digital Self-Efficacy

Teacher confidence varied widely. Innovative teachers incorporated community-based images and multilingual explanations, while others felt intimidated by the risk of technical failure. The findings underscore that teacher identity, digital self-efficacy, and emotional labour are central determinants of successful DST uptake.

6.6. Theoretical Implications

The findings extend DST theory by demonstrating that multimodal literacy in low-tech contexts is shaped not by tools but by cultural mediation, contextual adaptation, and teacher improvisation. This supports a shift toward a more inclusive DST framework grounded in adaptive multimodality and local narrative ecologies.

6.7. Global Contrast with Classic DST Models

Traditional DST models assume stable digital infrastructure and learner familiarity with production workflows [2,5]. In contrast, this study shows that rural EFAL teachers seldom engage in full digital production. Instead, effective DST emerges through simplified, improvised, and teacher-mediated practices. This highlights the need to rethink DST scholarship to reflect the realities of the Global South.

6.8. Policy Implications

The findings highlight the need for targeted policy adjustments within the Department of Basic Education to support low-tech digital pedagogies in rural schools. Policies should prioritise teacher digital readiness, ensuring that professional development focuses not only on device usage but also on multimodal pedagogy, scaffolding, and culturally grounded teaching strategies. In addition, CAPS support materials should include simplified, low-tech digital storytelling resources and exemplar lesson models tailored to rural realities. Finally, provincial and national ICT-in-Education strategies must foreground rural digital equity, addressing infrastructural deficits such as unreliable electricity and limited device access. Without these systemic supports, DST risks uneven implementation, potentially reinforcing rather than reducing the digital divide.

7. Conclusion

This study demonstrates that digital storytelling (DST) enhances EFAL reading comprehension not through technology alone, but through multimodal mediation, guided teacher scaffolding, and culturally grounded narrative practices in rural classrooms. The findings show that comprehension gains occur when teachers actively shape the learning process by pausing, questioning, prompting predictions, and linking multimodal story elements to learners' linguistic and cultural backgrounds. DST therefore functions as a pedagogical strategy rather than a technological event, with teacher

agency serving as the key determinant of success.

The study further revealed that rural teachers adapt DST creatively through low-tech and hybrid methods due to infrastructural constraints, including unreliable electricity, limited devices, and data scarcity. These adaptations challenge conventional global DST models and extend the theoretical understanding of multimodal literacy in low-resource contexts by foregrounding contextual improvisation, local narrative ecologies, and resource-sensitive multimodality.

At a broader level, the findings highlight the urgent need for context-responsive teacher development programmes, district-level support structures, and policy reforms that recognise the realities of rural schooling in South Africa. Strengthening digital readiness, providing simplified multimodal resources, and addressing infrastructural inequalities will be essential for scaling the benefits of DST. Ultimately, if scaled, DST has the potential to become one of the most context-appropriate and impactful literacy interventions for rural South African schools.

Author Contributions

Conceptualization, I.C.M. and F.T.N.; methodology, I.C.M.; software, I.C.M.; validation, I.C.M., F.T.N. and M.N.L.; formal analysis, I.C.M.; investigation, I.C.M.; resources, I.C.M.; data curation, I.C.M.; writing—original draft preparation, I.C.M.; writing—review and editing, I.C.M., F.T.N. and M.N.L.; visualization, I.C.M.; supervision, F.T.N. and M.N.L.; project administration, I.C.M.; funding acquisition, not applicable. All authors have read and agreed to the published version of the manuscript.

Funding

This work was supported by the University of Venda, which provided funding to cover the journal publication costs.

Institutional Review Board Statement

Ethical approval for this study was obtained from the University of Venda Research Ethics Committee and the Limpopo Department of Education prior to data collection.

Informed Consent Statement

Informed consent was obtained from all participants involved in the study.

Data Availability Statement

The data used in this study are available from the corresponding author upon reasonable request.

Acknowledgments

The authors acknowledge the participating schools and Grade 4 English First Additional Language teachers in the Vhembe District for their cooperation and contribution to this study.

Conflicts of Interest

The authors declare no conflict of interest.

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