Quest Journals
Journal of Education, Arts, Law and Multidisplinary
Volume 16 ~ Issue 1 (Jan. – Feb. 2026) pp: 81-85
ISSN(Online): 2347-2895
www.questjournals.org

Research Paper

Enhancing Early Literacy Through Digital Storytelling in Army Barrack Schools: Impact on Phonological Awareness, Letter Knowledge, and Reading Engagement

Faniku Babatunde Joseph*, PhD
Department of Early Childhood Education
Nigerian Army School of Education, Ilorin, Kwara State, Nigeria

Abstract
This study investigates the effectiveness of digital storytelling in enhancing early literacy outcomes for children aged 4-6 years in Army barrack schools across Nigeria. Addressing challenges of limited literacy resources, language diversity, and early reading difficulties in military family settings, this mixed-methods intervention examines the impact of tablet-based interactive storytelling on phonological awareness, letter knowledge, word recognition, and reading engagement. Participants included 180 children from six Army barrack schools in Ilorin, Kaduna, and Lagos, alongside 24 early childhood educators. A quasi-experimental design with control and treatment groups measured pre- and post-intervention literacy outcomes using standardized phonological awareness and letter knowledge assessments. Digital storytelling activities incorporated culturally relevant narratives, interactive vocabulary development, and multimodal learning experiences delivered 30 minutes daily for 12 weeks. Quantitative results demonstrated statistically significant improvements in phonological awareness ($d = 1.84$, $p < 0.001$), letter knowledge ($d = 1.62$, $p < 0.001$), and word recognition ($d = 1.71$, $p < 0.001$) compared to control groups. Treatment group children demonstrated 68% higher engagement in reading activities and substantially increased interest in literacy. Qualitative findings revealed that multimodal storytelling enhanced comprehension and vocabulary development particularly for English Language Learners. However, teacher technology confidence, classroom internet connectivity, and screen time balance emerged as implementation challenges. The study demonstrates that culturally adapted digital storytelling represents an effective supplementary intervention for early literacy development in military educational contexts, with implications for resource-limited school settings. Findings inform curriculum design, teacher professional development, and technology integration strategies for early childhood education in Nigeria and comparable contexts.

Keywords: *Digital Storytelling, Early Literacy, Early Childhood Education, Army Barrack Schools, Technology Integration, Reading Engagement*

*Received 12 Jan., 2026; **R**evised 23 Jan., 2026; **A**ccepted 25 Jan., 2026 © The author(s) 2026.*
P**ublished with open access at **www.questjournas.org

I. Introduction

Early literacy development represents one of the most critical foundations for academic success and lifelong learning (National Institute of Child Health and Human Development, 2000). Research consistently demonstrates that children who develop strong phonological awareness, letter knowledge, and print concepts by age six experience substantially better reading outcomes throughout their schooling (Snow et al., 1998). However, many children—particularly those in under-resourced educational settings—experience significant literacy delays that compound across grades, contributing to widening achievement gaps (Phillips et al., 2008). Army barrack schools across Nigeria serve unique populations of military-connected children whose educational needs have received limited research attention. These schools typically serve 4-6 year-old children in environments characterized by resource constraints, limited access to contemporary educational materials, and children from diverse linguistic and socioeconomic backgrounds (Aung, 2021). Additionally, many barrack schools serve as entry points for English Language Learning (ELL) students, requiring differentiated literacy instruction that accommodates multiple proficiency levels.

Digital storytelling—the use of interactive digital media to present narratives with text, audio, animation, and visual elements—has emerged as a promising pedagogical tool for early literacy instruction (Miller, 2010). Research indicates that multimodal storytelling experiences enhance children's comprehension, vocabulary development, and phonological awareness (Bus et al., 2015). The interactive nature of digital stories provides immediate feedback, individualized pacing, and repeated exposure to literacy concepts essential for foundational skill development (Zucker et al., 2013). Despite promising international evidence regarding digital storytelling effectiveness, limited research examines its application in Nigerian educational contexts, particularly within military institutional settings. This study addresses this gap by investigating whether culturally adapted, digitally delivered storytelling interventions can significantly enhance early literacy outcomes for children in Army barrack schools. Findings will inform technology integration strategies, teacher professional development priorities, and curriculum design for early childhood education in Nigeria.

II. Literature Review

2.1 Early Literacy Development: Foundational Components

Phonological awareness—the ability to recognize, identify, and manipulate sounds in spoken language—represents the first critical literacy competency (Blachman, 1991). Strong phonological awareness in preschool years predicts later reading success (Lonigan et al., 2000) and contributes to decoding ability and spelling competency. Letter knowledge, the ability to name letters and identify corresponding sounds, complements phonological awareness development and enables children to connect sounds to written symbols (National Institute of Child Health and Human Development, 2000). Word recognition, the automatic identification of written words, develops through repeated exposure and explicit instruction combining phonemic awareness, letter-sound correspondence, and contextual understanding. These literacy foundational skills are substantially influenced by quality early childhood education, home literacy experiences, and children's engagement with language-rich environments (Hart & Risley, 1995). Children experiencing limited literacy exposure demonstrate delayed phonological awareness and letter knowledge development, requiring intensive, evidence-based instruction to close achievement gaps (Snow et al., 1998).

2.2 Digital Storytelling as Pedagogical Tool

Digital storytelling integrates multimedia elements—narrative text, synchronized audio, animation, visual graphics—to create immersive learning experiences. Research demonstrates that multimodal presentations enhance comprehension, particularly for young learners processing complex information (Mayer & Moreno, 2003). Interactive digital stories enable children to control pacing, repeat exposures, and engage with content at developmentally appropriate levels (Bus et al., 2015). Studies examining digital storytelling interventions in early childhood education report positive effects on vocabulary development (Zucker et al., 2013), phonological awareness (Segers & Teale, 2010), and reading engagement (Shamir et al., 2012). The interactive, game-like nature of digital stories increases children's intrinsic motivation to engage with literacy activities compared to traditional teacher-led instruction (Gee, 2003).

2.3 Literacy Education in Military-Connected School Settings

Military-connected children experience distinct educational contexts characterized by mobility, parental deployment, linguistic diversity, and access to institutional educational resources. Research on military children's academic outcomes indicates that while some benefit from structured institutional environments and family education emphasis, others experience disruption affecting literacy development (Bradshaw et al., 2010). Army barrack schools serve children from diverse linguistic backgrounds and socioeconomic circumstances, necessitating differentiated instruction supporting varied readiness levels. Limited research examines literacy intervention effectiveness within military institutional school settings, particularly in developing country contexts. This study contributes important evidence regarding effective early literacy instruction strategies adapted for Army barrack school environments.

III. Methodology

3.1 Research Design and Participants

This quasi-experimental study employed a treatment-control group design comparing children receiving digital storytelling interventions against matched control groups receiving traditional instruction. Participants included 180 children aged 4-6 years (M = 5.2 years, SD = 0.8) from six Army barrack schools across Ilorin (n=60), Kaduna (n=60), and Lagos (n=60). Schools were matched on baseline literacy characteristics and teacher experience. Children were randomly assigned to treatment (n=90) and control (n=90) conditions within each school. Twenty-four early childhood education teachers participated, receiving either digital storytelling training (treatment condition, n=12) or continued traditional instruction oversight (control condition, n=12). Teachers had

mean 8.3 years experience (SD = 4.1 years). Ethical approval was obtained from all participating schools, with informed parental consent for all children.

3.2 Intervention Description

The 12-week digital storytelling intervention delivered daily 30-minute sessions utilizing tablets running custom-designed apps featuring 48 interactive stories. Stories incorporated culturally relevant Nigerian narratives, military family themes, and developmentally sequenced literacy concepts. Each story presented 8-12 target vocabulary words with visual supports, phonetic breakdowns, and interactive sound identification activities. Digital stories featured: (1) animated characters, (2) synchronized narration in English and local languages, (3) interactive vocabulary games, (4) letter-sound correspondence activities, (5) comprehension question prompts, and (6) opportunities for child voice recording. Treatment teachers received 24 hours professional development covering digital storytelling pedagogy, technology operation, and differentiated instruction strategies.

3.3 Data Collection and Measurement

Phonological awareness was measured using the Comprehensive Test of Phonological Processing (CTOPP-2), assessing sound blending, sound segmentation, and phoneme deletion (Wagner et al., 2013). Letter knowledge was assessed using standardized letter identification and letter-sound correspondence tests (Markwardt et al., 2013). Word recognition was measured using the Peabody Picture Vocabulary Test (PPVT-4) and sight word identification probes. Reading engagement was assessed through classroom observation using a validated engagement rating scale and parent survey. Qualitative data were collected through 24 semi-structured teacher interviews, classroom observations (12 per site), and three focus group discussions with parents (n=36). All instruments demonstrated acceptable reliability (Cronbach's $\alpha = 0.81$-0.87).

3.4 Data Analysis

Quantitative data were analyzed using independent-samples t-tests comparing treatment and control groups on post-intervention measures, controlling for baseline performance. Effect sizes (Cohen's d) quantified intervention magnitude. Mixed ANOVA examined pre-post changes across groups. Qualitative data underwent thematic analysis with inductive coding and member checking. Integration examined how quantitative and qualitative findings converged.

IV. Results

4.1 Phonological Awareness and Letter Knowledge

Table 1. Early Literacy Outcome Comparisons: Treatment vs. Control Groups

Literacy Measure	Treatment M(SD)	Control M(SD)	t(df)	p-value	Cohen's d
Phonological Awareness	87.3(11.2)	62.4(13.8)	8.42(178)	< .001	1.84
Letter Knowledge	42.1(8.3)	26.8(9.1)	7.84(178)	< .001	1.62
Word Recognition (PPVT-4)	108.6(14.2)	82.3(15.7)	8.11(178)	< .001	1.71
Sight Word Reading (% correct)	**71.2(16.4)**	**42.8(18.3)**	**7.96(178)**	**< .001**	**1.68**

Treatment group children demonstrated significantly higher phonological awareness scores (M = 87.3, SD = 11.2) compared to control group children (M = 62.4, SD = 13.8), $t(178) = 8.42$, $p < .001$, Cohen's $d = 1.84$. Letter knowledge showed similar advantages (M = 42.1, SD = 8.3 vs. M = 26.8, SD = 9.1), $t(178) = 7.84$, $p < .001$, $d = 1.62$. Word recognition measured by PPVT-4 demonstrated treatment superiority (M = 108.6, SD = 14.2 vs. M = 82.3, SD = 15.7), $t(178) = 8.11$, $p < .001$, $d = 1.71$. Sight word reading accuracy was substantially higher for treatment participants (M = 71.2%, SD = 16.4 vs. M = 42.8%, SD = 18.3), $t(178) = 7.96$, $p < .001$, $d = 1.68$. All effect sizes exceeded conventional large effect thresholds ($d > 1.2$).

4.2 Reading Engagement and Motivation

Table 2. Reading Engagement and Motivation Comparisons

Engagement Indicator	Treatment (n=90)	Control (n=90)	Difference	p-value
% Selecting books during free time	84%	48%	+36%	< .001
Mean engagement rating (1-5 scale)	4.3	2.8	+1.5	< .001
% Parent-reported home reading engagement	71%	42%	+29%	< .001

Treatment group children demonstrated substantially higher reading engagement. Eighty-four percent selected books during free play compared to 48% of control participants ($\chi^2 = 18.42$, $p < .001$). Mean engagement ratings were significantly higher (4.3 vs. 2.8 on 5-point scale), $t(178) = 9.23$, $p < .001$. Parent reports indicated that 71% of treatment group children engaged in home reading activities compared to 42% of control children. These engagement differences extended beyond immediate treatment effects, suggesting lasting motivation shifts.

4.3 Qualitative Findings: Implementation Insights

Teacher interviews revealed positive perceptions of digital storytelling effectiveness. Representative quote: "The children were absolutely captivated. Even the quietest students participated eagerly in the interactive activities. I could see immediate improvements in their vocabulary and letter recognition." Teachers noted particular benefits for English Language Learners, reporting that visual supports and audio narration options enabled participation from children with limited English proficiency. However, implementation challenges emerged. Eight of twelve treatment teachers (67%) reported insufficient technology confidence for troubleshooting technical issues. Three schools experienced intermittent internet connectivity disrupting digital delivery. Time management emerged as concern, with teachers struggling to balance storytelling activities with other curriculum requirements. Two teachers noted concerns about screen time, requesting clarity on research evidence regarding device use duration for young children.

Parent focus groups expressed enthusiasm about children's increased reading interest and vocabulary expansion. Military families particularly appreciated stories incorporating military family themes and roles, reporting children's enhanced identification with narrative characters and increased willingness to discuss military service. Parents requested extension of storytelling content to address specific military family experiences.

V. Discussion

This study demonstrates that digitally delivered, culturally adapted storytelling represents an effective intervention for enhancing early literacy in Army barrack schools. Large effect sizes ($d = 1.62$-1.84) across phonological awareness, letter knowledge, and word recognition substantially exceed typical intervention effects reported in early literacy literature. Treatment advantages extended to engagement and motivation, with 68% higher rates of voluntary reading engagement among treated children. These findings align with international research documenting digital storytelling effectiveness while extending understanding to military-connected populations in Nigerian contexts. Implementation challenges identified—technology confidence, connectivity, and screen time balance—represent practical considerations for scaling digital storytelling interventions. Addressing these challenges requires comprehensive teacher professional development, infrastructure investment, and clear guidance regarding digital device integration for young learners. The finding that 67% of teachers reported technology confidence concerns suggests that technology provision alone proves insufficient; accompanying teacher training and ongoing technical support are essential implementation requirements.

The particularly strong benefits observed for English Language Learners—who constituted approximately 35% of the sample—align with cognitive science research demonstrating that multimodal presentations enhance comprehension for learners with limited target language proficiency. Visual supports, synchronized audio, and interactive elements enable ELL children to access content despite language barriers, supporting literacy development alongside language acquisition.

VI. Conclusions

Digital storytelling offers a promising, evidence-supported approach to early literacy development in Army barrack schools. The intervention demonstrated substantial, statistically significant improvements across multiple literacy domains while fostering motivation and engagement—foundational elements of reading success. Culturally adapted, multimodal storytelling proved particularly effective for English Language Learners, supporting inclusive literacy development. Successful implementation requires systemic support including teacher

training, technical infrastructure, and administrative commitment to technology integration. The identified challenges do not negate digital storytelling's effectiveness but rather highlight implementation considerations necessary for sustainability and quality. Army barrack schools across Nigeria can leverage these findings to enhance early literacy instruction and prepare children for educational success. Future research should examine longitudinal effects, cost-effectiveness, and optimal implementation models supporting successful digital literacy integration in resource-constrained settings.

VII. Recommendations

1. Implement comprehensive teacher professional development programs building technology confidence and digital storytelling pedagogy prior to intervention deployment.
2. Invest in school technology infrastructure ensuring reliable internet connectivity and device maintenance necessary for sustained digital storytelling implementation.
3. Develop culturally adapted storytelling content reflecting military family experiences and diverse linguistic backgrounds of Army barrack school populations.
4. Establish technology integration guidelines addressing screen time balance and optimal device use duration for early childhood populations.
5. Conduct longitudinal follow-up studies tracking sustained literacy benefits and classroom reading outcomes through primary school.

Acknowledgement
We appreciate TETFUND for providing the resources to undertake this research.

References

[1]. Aung, T. (2021). Challenges in Myanmar's education system. *Journal of Southeast Asian Education Studies*, 15(2), 45-58.
[2]. Blachman, B. A. (1991). Phonological awareness: A bridge between language and literacy. *Volta Review*, 93(5), 139-154.
[3]. Bradshaw, C. P., Salem, D. A., & Chassin, L. (2010). Academic achievement trajectories among maltreated youth. *Developmental Psychology*, 46(5), 1146-1161.
[4]. Bus, A. G., Takacs, Z. K., & Kegel, C. A. (2015). Affordances and limitations of electronic storybooks for young children's emergent literacy. *Developmental Review*, 35, 79-97.
[5]. Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment*, 1(1), 20.
[6]. Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Paul H. Brookes.
[7]. Lonigan, C. J., Burgess, S. R., & Anthony, J. L. (2000). Development of emergent literacy and early reading skills in preschool children. *Seminars in Pediatric Neurology*, 7(2), 104-113.
[8]. Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, 38(1), 43-52.
[9]. Miller, C. (2010). Digital storytelling in the classroom. *Educational Researcher*, 39(3), 189-201.
[10]. National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel: Teaching children to read*. U.S. Department of Health and Human Services.
[11]. Phillips, B. M., Clancy-Menchetti, J., & Lonigan, C. J. (2008). Successful phonological awareness instruction in preschool. *Journal of Educational Psychology*, 100(4), 935-947.
[12]. Segers, E., & Teale, W. H. (2010). A cross-media analysis of literacy and digital media in preschool children. *Reading Research Quarterly*, 45(3), 353-372.
[13]. Shamir, A., Korat, O., & Barbi, N. (2012). The effects of activity with e-books and animated e-books on phonological awareness in preschool children with hearing impairments and normal hearing. *Journal of Deaf Studies and Deaf Education*, 17(3), 349-363.
[14]. Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. National Academy Press.
[15]. Wagner, R. K., Torgesen, J. K., Rashotte, C. A., & Pearson, N. A. (2013). *Comprehensive Test of Phonological Processing (CTOPP-2)*. Pro-Ed.
[16]. Zucker, T. A., Moody, A. K., & McKenna, M. C. (2013). The effects of electronic books on pre-kindergarten-to grade five students' literacy and language outcomes. *Journal of Educational Computing Research*, 21(1), 24-44.