

Reducing Learning Poverty through a Comprehensive Digital Literacy Program: Evidence from a School-Community Literacy Intervention in a Geographically Isolated Philippine Elementary School

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Abstract Learning poverty remains a major barrier to educational equity, particularly in low- and middle-income countries where many children do not acquire the reading skills needed for continued learning. In the Philippines, results from both international and national assessments continue to highlight persistent challenges in foundational literacy, underscoring the need for interventions that respond to local educational realities. This study examined the effectiveness of the Alleviating Learning Poverty through a Comprehensive Digital Literacy Program implemented at a public integrated school in Talakag, Bukidnon. Using a mixed-methods intervention evaluation design, the study assessed changes in learners' reading proficiency through the Philippine Informal Reading Inventory (PHIL-IRI) and explored the instructional and contextual factors that shaped literacy development. The ten-month program integrated the Reading A-Z digital platform, daily reading remediation, teacher professional development, technology-supported instruction, and active parent and community participation. Results showed marked improvements in learners' reading proficiency. The proportion of frustration-level readers declined from 38.22% to 13.38%, while the percentages of instructional- and independent-level readers increased over the course of the intervention. Classroom observations and teacher interviews suggested that differentiated instruction, consistent teacher support, access to leveled reading materials, and stronger home-school partnerships helped foster these gains. At the same time, persistent challenges such as chronic absenteeism, poverty-related responsibilities, and limited opportunities for reading beyond school continued to affect some learners. These findings suggest that improving foundational literacy requires more than access to digital resources alone. When technology is combined with effective teaching, structured reading support, and meaningful community involvement, schools can make substantial progress in reducing learning poverty, even in geographically isolated and resource-constrained settings. The study adds to the growing evidence that integrated school-community approaches can strengthen literacy outcomes and offers practical insights for educators, policymakers, and development organizations seeking sustainable strategies to improve early reading achievement.

Keywords: learning poverty, foundational literacy, digital literacy, Reading A-Z, PHIL-IRI, school-community partnership, educational technology

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1. Introduction

The ability to read with understanding during the early years of schooling shapes a child's educational trajectory and influences lifelong learning opportunities. Children who develop strong reading skills in the primary grades are more likely to succeed academically, remain engaged in school, and experience better educational and socioeconomic outcomes later in life [1]. Reading serves

as the foundation for learning across virtually every subject area; consequently, learners who fail to acquire basic literacy skills early often encounter cumulative learning difficulties that become increasingly difficult to overcome. Recognizing its central role in educational development, the international community has identified foundational literacy as a key priority in achieving Sustainable Development Goal 4, which calls for inclusive, equitable, and quality education for all [2].

Despite sustained efforts to improve access to education, learning poverty remains one of the most pressing global

education challenges. The World Bank and the UNESCO Institute for Statistics define learning poverty as the inability of a child to read and understand a simple age-appropriate text by the age of ten [3]. Beyond measuring reading proficiency, this indicator reflects whether education systems are enabling children to acquire the foundational skills needed for continued learning. The effects of the COVID-19 pandemic further intensified this challenge. Widespread school closures, unequal access to digital technologies, and persistent socioeconomic disparities disrupted learning on an unprecedented scale, particularly among vulnerable populations. As a result, global estimates indicate that learning poverty increased substantially, reversing years of progress in improving foundational literacy [4].

The Philippine education system reflects many of these global concerns. Results from the Programme for International Student Assessment (PISA) 2022 showed that Filipino learners continued to perform well below the OECD average in reading literacy, with only about one-fourth reaching the minimum level of proficiency expected of 15-year-old students [5]. More recently, the Second Congressional Commission on Education (EDCOM II) described the country's literacy situation as a national learning crisis after reporting that many learners in the early grades were reading below expected levels [6]. These findings suggest that a considerable number of Filipino learners progress through the education system without developing the reading competencies required for independent learning and meaningful participation in an increasingly knowledge-driven society.

The challenge is particularly pronounced in geographically isolated and economically disadvantaged communities, where schools frequently contend with limited instructional resources, inadequate technological infrastructure, irregular learner attendance, and persistent socioeconomic hardship [4]. These conditions influence literacy development in ways that extend well beyond classroom instruction. Children's opportunities to learn are shaped by the interaction of their families, schools, communities, and broader social environments, a perspective consistent with Bronfenbrenner's [7] ecological systems theory. Recent research further shows that disparities in digital access, teacher support, and learning opportunities continue to widen literacy gaps among disadvantaged learners, emphasizing the need for interventions that respond to both instructional and contextual challenges [5].

Digital technologies have expanded opportunities to strengthen literacy instruction by enabling teachers to provide reading materials that match learners' instructional needs while monitoring progress more efficiently. Platforms such as Reading A-Z support differentiated instruction through leveled texts, formative assessment, and individualized learning pathways. However, recent research suggests that technology alone does not improve reading achievement. Its effectiveness depends largely on how well digital tools are integrated with evidence-based teaching, purposeful learner engagement, and ongoing teacher support [8,9]; and [10]. Similarly, [11] argue that reading development is best understood as a coordinated process involving word recognition, language comprehension, background knowledge, motivation, and

strategic instruction rather than isolated instructional practices. Kim's [12] interactive dynamic literacy model likewise highlights that successful reading instruction requires the integration of cognitive, linguistic, and instructional factors, reinforcing the importance of comprehensive literacy interventions.

This study is guided by an integrated perspective on literacy development that recognizes reading acquisition as both a cognitive and a social process. Drawing on [13] sociocultural theory, literacy develops through meaningful interactions among learners, teachers, families, and communities, with guided support enabling learners to move toward increasingly independent reading. Complementing this perspective, Bronfenbrenner's [7] ecological systems theory highlights how children's learning is shaped by interconnected environments extending beyond the classroom. Together, these perspectives suggest that sustained improvements in literacy are most likely to occur when effective teaching, differentiated instruction, technology-supported learning, and active family and community engagement work in concert rather than as isolated initiatives.

Against this backdrop, the Rotary Club of Cagayan de Oro Counterpoint implemented the **Alleviating Learning Poverty through a Comprehensive Digital Literacy Program** at Cosina Integrated School in Talakag, Bukidnon. Rather than introducing a single instructional innovation, the program brought together five complementary components: (1) the implementation of the Reading A-Z digital literacy platform; (2) structured daily reading remediation beyond regular instructional hours; (3) teacher professional development focused on differentiated literacy instruction and technology integration; (4) the provision of digital devices and instructional resources; and (5) active participation of parents and community volunteers in supporting literacy development outside school. By integrating these elements into a coordinated intervention, the program sought to strengthen learners' reading proficiency while addressing contextual barriers that commonly limit literacy development in underserved communities.

Although various literacy initiatives have been implemented within Philippine basic education, relatively few empirical studies have examined interventions that integrate educational technology, structured remediation, teacher professional development, and community engagement within geographically isolated schools. Much of the existing literature considers these components independently, leaving limited understanding of how they interact to improve learner outcomes. There is also a shortage of studies documenting learner movement across PHIL-IRI proficiency levels while examining the instructional and contextual conditions that either facilitate or constrain literacy development. This gap limits the evidence available to educators, policymakers, and development organizations seeking sustainable and scalable approaches to addressing learning poverty.

This study addresses that gap by evaluating the implementation of the **Alleviating Learning Poverty through a Comprehensive Digital Literacy Program** at Cosina Integrated School. Specifically, it examines changes in learners' reading proficiency before and after the intervention, explores patterns of literacy development

across grade levels, identifies the instructional and contextual factors associated with literacy gains, and documents the implementation challenges encountered throughout the program. By providing empirical evidence from a school-community literacy initiative implemented in a geographically isolated Philippine elementary school, the study contributes to the growing body of literature on learning poverty, digital literacy, educational equity, and integrated approaches to improving foundational reading outcomes. The findings are expected to inform future literacy policies and provide practical guidance for educators, development organizations, and policymakers working to improve literacy outcomes among vulnerable learners.

2. Methods

2.1. Research Design

This study employed a **convergent mixed-methods intervention evaluation design** to examine the implementation and outcomes of the *Alleviating Learning Poverty through a Comprehensive Digital Literacy Program* at Cosina Integrated School in Talakag, Bukidnon, Philippines. A mixed-methods approach was selected because it allowed quantitative measures of learners' reading achievement to be interpreted alongside qualitative evidence describing how the intervention was implemented and experienced in the school context. Collecting and integrating both forms of evidence provided a more comprehensive understanding of not only whether the program improved reading proficiency but also the instructional and contextual conditions that shaped those outcomes [14] and [15].

The quantitative component examined changes in learners' reading proficiency using results from the **Philippine Informal Reading Inventory (PHIL-IRI)** administered before and after the intervention. PHIL-IRI is the Department of Education's standardized assessment used to determine learners' reading proficiency and classify performance into the **Frustration, Instructional, and Independent** reading levels [16].

To complement the quantitative findings, qualitative data were gathered through teacher interviews, classroom observations, learner progress records, implementation reports, and documentation produced throughout the ten-month implementation period. These sources provided insight into classroom practices, learner engagement, instructional adjustments, and contextual influences that could not be captured through assessment scores alone. The two datasets were analyzed independently and integrated during interpretation, consistent with the convergent mixed-methods design, allowing areas of convergence, complementarity, and divergence to emerge [14].

2.2. Research Setting

The study was conducted at an **integrated public elementary school** in the municipality of Talakag, Bukidnon, Philippines. The school serves learners from a geographically isolated and economically disadvantaged community where limited access to educational resources,

digital technologies, and learning support continues to influence educational opportunities. Most households rely on subsistence farming or seasonal agricultural work, circumstances that often affect school attendance, learning continuity, and opportunities for reading practice outside formal classroom instruction.

School records prior to the intervention indicated that many learners experienced considerable difficulty in reading, with a substantial proportion classified at the **Frustration Level** based on PHIL-IRI assessments. These baseline conditions highlighted the need for an intervention that addressed not only reading instruction but also the broader instructional and environmental factors influencing literacy development. The school therefore provided an appropriate setting for examining the effectiveness of an integrated literacy program combining digital learning resources, teacher capacity-building, structured reading support, and community participation.

2.3. Participants

The literacy program was implemented across **Grades 1 to 6**. For the purposes of the formal evaluation, however, quantitative analyses focused on learners in **Grades 3 to 6**, the grade levels in which PHIL-IRI is routinely administered in accordance with Department of Education guidelines [16]. All learners who completed both the baseline and post-intervention assessments were included in the quantitative analysis. A total population of 157 learners were included as participants in the pre-test and post-test.

The qualitative component employed purposive sampling to include teachers directly involved in implementing the intervention. These teachers participated in interviews and contributed classroom observations, learner monitoring records, implementation reports, and reflective narratives documenting instructional experiences throughout the project. Additional qualitative evidence was drawn from records of parent engagement activities, community literacy initiatives, and project documentation generated during implementation. Bringing together these multiple perspectives provided a richer understanding of how the intervention influenced learners' reading development and the factors that supported or constrained its implementation.

2.4. Description of the Intervention

The **Alleviating Learning Poverty through a Comprehensive Digital Literacy Program** was designed as an integrated school-community initiative rather than a technology-driven reading program. The intervention recognized that improving literacy requires coordinated support involving effective instruction, appropriate learning resources, teacher expertise, and active family and community participation. This perspective is consistent with ecological and sociocultural views of learning, which emphasize that children's literacy development is shaped by interactions among learners, teachers, families, schools, and the wider community [7] and [13].

The intervention consisted of five complementary components. The first component involved differentiated

reading instruction through the Reading A-Z digital literacy platform. Teachers assigned leveled reading materials that matched learners' assessed reading abilities and used the platform's monitoring tools to track progress and adjust instruction according to individual learning needs. Research suggests that digital literacy platforms are most effective when integrated into purposeful teaching rather than used as stand-alone technologies [8] and [11].

The second component was a structured 30-minute daily reading remediation session conducted beyond regular class hours. These sessions provided learners with additional opportunities to strengthen decoding, phonics, vocabulary, fluency, and reading comprehension through guided practice without reducing instructional time allocated to other learning areas.

The third component focused on teacher professional development. Participating teachers attended training sessions on differentiated literacy instruction, effective reading strategies, technology integration, and the instructional use of Reading A-Z. Strengthening teacher knowledge and instructional practice was considered essential because evidence consistently shows that technology contributes to learning only when supported by effective pedagogy and informed instructional decision-making [17].

The fourth component strengthened the school's instructional capacity through the provision of digital and instructional resources. These included laptop computers, classroom television displays, printing and laminating equipment, office supplies, instructional materials, and institutional access to Reading A-Z. These resources expanded teachers' capacity to develop, reproduce, and adapt literacy materials suited to learners' varying reading abilities.

The final component extended literacy support beyond the classroom through active parent and community engagement. Parents and community volunteers participated in orientation sessions and literacy activities designed to strengthen home support for children's reading development. By encouraging regular reading practice outside school and promoting collaboration between teachers and families, the program sought to create a learning environment in which literacy development continued beyond formal classroom instruction.

Rather than functioning as separate activities, these five components operated as an integrated system of support. Together they addressed instructional, technological, and contextual barriers that contribute to learning poverty while providing learners with sustained opportunities to strengthen their reading skills.

3. Results

This study examined the outcomes of the Alleviating Learning Poverty through a Comprehensive Digital Literacy Program by integrating quantitative evidence from the Philippine Informal Reading Inventory (PHIL-IRI) with qualitative data gathered through teacher interviews, classroom observations, learner monitoring records, and implementation reports. Presenting these sources together provides a more comprehensive understanding of the intervention, allowing changes in

reading proficiency to be interpreted alongside the instructional practices and contextual factors that shaped those outcomes [14].

Across the ten-month implementation period, learners demonstrated measurable improvements in reading proficiency, while teachers reported notable changes in learner engagement, confidence, and participation during literacy activities. Rather than attributing these improvements to a single intervention component, the findings suggested that literacy gains emerged through the combined influence of differentiated instruction, sustained teacher support, appropriate use of digital resources, structured reading remediation, and active collaboration between the school and families. This pattern reflects current evidence that meaningful improvements in foundational literacy are most likely when instructional, technological, and social supports operate together rather than in isolation [11] and [12].

2.5. Qualitative Data Analysis and Establishing Trustworthiness

The qualitative data generated from the interviews, classroom observations, implementation reports, and reflective narratives were analyzed using the principles of constructivist grounded theory as articulated by [18]. The analysis proceeded iteratively rather than treating the qualitative data as separate sources. Data collection, coding, comparison, and interpretation were undertaken as interconnected processes to allow patterns and meanings emerging from participants' experiences to inform the developing categories.

The analysis began with initial coding, during which the researcher examined the data line by line and assigned concise codes that captured actions, experiences, perceptions, and conditions expressed in the participants' accounts and observed during classroom implementation. Wherever appropriate, gerund-based codes were used to remain close to participants' actions and experiences. The researcher maintained analytic sensitivity to participants' meanings and avoided imposing predetermined categories on the data.

Initial codes were subsequently compared with one another through constant comparative analysis. Similar and conceptually related codes were examined across participants, data sources, and stages of implementation. Through this process, recurring patterns were identified and less significant or redundant codes were consolidated. The analysis then proceeded to focused coding, in which the most significant, frequent, and conceptually meaningful initial codes were used to synthesize larger segments of data and develop more substantive categories.

The developing categories were continuously compared with the original interview accounts, classroom observations, implementation reports, and reflective narratives. This process enabled the researcher to examine whether emerging interpretations were consistently supported across the different sources of evidence. Analytic memos were also used throughout the process to document emerging insights, relationships among categories, questions, interpretive decisions, and the rationale for refining or combining codes and categories. Through successive rounds of comparison and refinement,

related categories were integrated into broader conceptual themes that captured the participants' experiences of and responses to the Comprehensive Digital Literacy Program.

Triangulation and Qualitative Rigor

To strengthen the credibility of the qualitative findings, data-source triangulation was employed. Evidence from interviews was compared with classroom observations, implementation reports, and reflective narratives to determine whether emerging interpretations were supported across different sources. Convergence and divergence among the sources were considered during the interpretation rather than assuming that all sources would necessarily produce identical accounts. This process provided a more comprehensive understanding of the implementation of the intervention and the experiences associated with it.

Trustworthiness was further supported through an audit trail of the analytic process. Coding decisions, category development, analytic memos, and revisions of emerging interpretations were documented to provide a transparent record of how the findings were derived from the qualitative data. The researcher repeatedly returned to the original data during category and theme development to ensure that interpretations remained grounded in participants' accounts and observed implementation experiences.

The qualitative analysis also employed constant comparison across participants and data sources. Emerging categories were examined against both supporting and contradictory evidence to avoid relying solely on particularly salient or frequently occurring responses. Themes were retained when they demonstrated conceptual relevance and sufficient grounding in the collected evidence. These procedures were intended to enhance the credibility, dependability, confirmability, and transferability of the qualitative findings.

The qualitative findings were subsequently integrated with the quantitative results to provide a more comprehensive account of how the Comprehensive Digital Literacy Program was implemented and how participants experienced and perceived its contribution to literacy development.

3.1. The Intervention Contributed to a Substantial Reduction in Learning Poverty

Before the implementation of the program, more than one-third of participating learners belonged to this category. After ten months of sustained intervention, the most significant outcome of the intervention was the marked decline in the proportion of learners classified at the Frustration Level, the PHIL-IRI category representing learners who experienced serious difficulty reading and understanding grade-level texts independently.

Table 1 presents the chi-square test of homogeneity conducted to determine whether the distribution of learners across English PHIL-IRI reading proficiency levels differed between the pre-intervention and post-intervention assessments. The analysis revealed a statistically significant difference in the distribution of reading proficiency levels, $\chi^2(2, N = 314) = 37.97, p < .001$, with a medium-to-large effect size (Cramér's V

= .35). Specifically, the proportion of learners classified at the Frustration level decreased from 38.22% to 13.38%, while the proportion of learners at the Independent level increased from 6.37% to 26.11%. These findings indicated a significant positive shift in learners' English reading proficiency following the Comprehensive Digital Literacy Intervention.

Table 1. Chi-Square Test of Homogeneity Comparing English PHIL-IRI Reading Proficiency Before and After the Comprehensive Digital Literacy Intervention

Reading Proficiency Level	Pretest (n = 157)	Posttest (n = 157)	χ^2	df	p	Cramér's V	Interpretation
Frustration	60 (38.22%)	21 (13.38%)	37.97	2	< .001	0.35	Significant
Instructional	87 (55.41%)	95 (60.51%)					
Independent	10 (6.37%)	41 (26.11%)					

Note: A commonly used set of guidelines, particularly following **Cohen's conventions**, is approximately 0.00-No Association; 0.10 Weak/Small; 0.30 Moderate /Medium and .50 Large/strong

Beyond the numerical improvements reflected in the PHIL-IRI results, teachers consistently described noticeable changes in learners' day-to-day reading behaviors. Many observed that learners who had previously avoided reading aloud gradually became more willing to participate in guided reading sessions, classroom discussions, and oral reading activities. Improvements in confidence frequently became evident before learners formally moved to a higher PHIL-IRI category, suggesting that literacy growth developed progressively rather than occurring only when reflected in assessment classifications. This observation was consistent with contemporary models of reading development, which viewed literacy as a cumulative process involving the gradual integration of decoding, language comprehension, vocabulary, fluency, and reading motivation [12] and [19].

Teachers also attributed these improvements to the structured and individualized nature of the intervention. One participant emphasized that the systematic use of leveled reading materials, guided instruction, and digital resources enabled learners to progress at a pace appropriate to their abilities, explaining that *"the structured A-Z Reading Program routines, including leveled reading instruction, consistent guided practice, and the integration of digital and printed resources, worked exceptionally well and should be institutionalized to sustain improved literacy outcomes."* (P3)

Other teachers emphasized that sustained instructional support was equally important. Several participants recommended maintaining individualized intervention even after learners demonstrated improvement, particularly for those who continued to struggle with foundational reading skills. As one teacher observed, learners who remained at the frustration level required *"daily one-on-one or small-group reading intervention focusing on phonics, decoding, and vocabulary building, along with more frequent guided reading sessions using leveled A-Z materials."* Another similarly recommended *"intensive, one-on-one diagnostic tutoring and high-*

frequency intervention sessions" (P1) to address persistent phonetic and decoding difficulties among struggling readers.

Teachers further noted that literacy improvement was influenced by factors extending beyond classroom instruction. Several participants pointed to the importance of family involvement and learner well-being, emphasizing that sustained reading progress depended on strong home-school collaboration and regular attendance. One teacher explained that *"strong collaboration between the school and home is needed to strengthen reading skills and ensure consistent home reading support."* (P6) Another highlighted the reality faced by many learners, remarking that *"teachers' techniques and the program won't be appealing when their stomach is empty,"* and recommended the provision of school feeding and learner incentives to improve attendance and engagement.

Taken together, the quantitative and qualitative findings indicated that the reduction in learning poverty cannot be attributed solely to access to digital resources. Rather, the intervention succeeded because digital tools were integrated with explicit literacy instruction, differentiated teaching, sustained remediation, and meaningful partnerships with families and the wider community. This integrated approach reflected growing evidence that improvements in foundational literacy were most sustainable when schools address both instructional quality and the broader conditions that influence children's opportunities to learn [17] & [13].

3.2. Literacy Gains Were Evident Across Grade Levels

Analysis of the PHIL-IRI results showed that improvements in reading proficiency were observed across all participating grade levels, although the extent of improvement varied according to learners' initial reading abilities and developmental readiness. While every grade demonstrated positive movement following the ten-month intervention, older learners generally exhibited larger gains in independent reading, whereas younger learners showed substantial progress in developing the foundational skills necessary for later reading independence.

The improvement observed among Grade 3 learners was characterized primarily by a reduction in the proportion of learners classified at the Frustration Level. Teachers reported that many children who initially struggled to decode simple words gradually became more accurate readers after receiving daily guided reading and explicit phonics instruction. Although many of these learners remained at the Instructional Level at the end of the intervention, classroom observations indicated clear improvements in decoding, oral reading fluency, and confidence during reading activities. These findings were consistent with current evidence suggesting that early literacy development depended on the gradual strengthening of decoding, vocabulary, and language comprehension rather than on abrupt transitions between proficiency categories [20].

Among Grade 4 learners, assessment results likewise indicated fewer frustration-level readers and a

corresponding increase in learners performing at the Instructional Level. Teachers observed that many pupils became more engaged during reading sessions once they were provided with texts that matched their reading abilities. One participant explained that differentiated reading materials enabled learners to participate more actively because they no longer felt overwhelmed by texts that were beyond their instructional level. The participant emphasized that *"continued support to reading and provision [of] reading materials"* (P4) remained essential for sustaining learners' progress. These observations suggested that instructional matching of texts to learners' abilities encouraged more active participation and reduced the frustration commonly experienced by struggling readers.

The intervention also produced meaningful improvements among Grade 5 learners, where the proportion of learners classified at the Independent Level increased by 11.35 percentage points. Although this increase was more modest than that observed among Grade 6 learners, teachers consistently described noticeable improvements in reading fluency, vocabulary development, and comprehension throughout the implementation period. Several learners who remained within the same PHIL-IRI category nevertheless demonstrated greater confidence in reading aloud, completed classroom reading tasks more independently, and participated more actively during guided reading sessions. These observations reinforced the view that meaningful literacy growth often preceded measurable changes in standardized reading classifications [11].

The largest improvement was recorded among Grade 6 learners, whose Independent-Level classification increased by 50.97 percentage points following the intervention. Teachers attributed this substantial gain to the combined effects of differentiated instruction, learners' increasing cognitive maturity, and sustained opportunities to practice reading using leveled materials. According to one participant, individualized support allowed struggling learners to progress at their own pace while continuing to build confidence through repeated reading experiences. Another teacher emphasized that learners who continue to require support should receive *"one-on-one or small-group instruction, more phonics and fluency practice, differentiated materials, and closer monitoring with targeted interventions."* (P1,P5,&P3) This recommendation reflected teachers' recognition that literacy development continued beyond the conclusion of a single intervention and required sustained instructional support for learners with persistent reading difficulties.

Table 2. Summary of Grade-Level Literacy Progress Following the Intervention

Grade Level	Major Improvement Observed
Grade 3	Reduction in Frustration-Level readers accompanied by stronger decoding skills and improved oral reading confidence
Grade 4	Increased Instructional-Level readers, greater classroom participation, and improved reading engagement
Grade 5	increase in Independent-Level readers, with noticeable gains in fluency, vocabulary, and comprehension
Grade 6	increase in Independent-Level readers, representing the largest literacy gain across participating grade levels

Teacher narratives further suggested that differences in literacy gains were influenced not only by age but also by learners' previous exposure to reading, vocabulary development, school attendance, and support received at home. Participants repeatedly emphasized that learners who experienced frequent absences often required considerably more time to demonstrate comparable progress. One teacher noted that *"some learners have frequent absences that resulted into their frustration level... due to their economic status."*(P6) *In order to support this, the school must have a feeding program for the less fortunate children."*(P10 and P12) Another participant stressed that *"strong collaboration between the school and home (family support) is needed to strengthen reading skills and ensure consistent home reading support."* (P8). These comments highlighted that literacy development was shaped not only by classroom instruction but also by learners' social and economic circumstances, reinforcing ecological perspectives that viewed reading achievement as the product of interactions among schools, families, and communities [7].

Although the magnitude of improvement differed across grade levels, no evidence suggested that the intervention benefited only a particular group of learners. Instead, the combined quantitative and qualitative findings indicated that the Comprehensive Digital Literacy Program supported literacy growth across the elementary grades by providing differentiated instruction, sustained teacher guidance, and learning experiences responsive to learners' varying needs. The stronger gains observed among older learners likely reflected their greater readiness to apply foundational reading skills to increasingly complex texts, while the progress made by younger learners demonstrated that early, sustained intervention could strengthen the building blocks of later reading success.

3.3. Literacy Development Was Progressive Rather Than Categorical

The findings suggested that improvements in reading did not occur suddenly or only when learners moved from one PHIL-IRI category to another. Instead, literacy developed gradually through a series of small but meaningful changes that became evident in the classroom long before they appeared in the assessment results. While the post-intervention PHIL-IRI scores confirmed significant gains in reading proficiency, teachers consistently observed that learners had already begun demonstrating stronger reading behaviors several weeks and even months before these gains were reflected in their formal classifications.

Teachers recalled that many struggling readers first showed progress through increased participation rather than dramatic improvements in test performance. Children who had previously avoided reading aloud began volunteering during guided reading sessions, attempted unfamiliar words with greater confidence, and became more willing to answer comprehension questions. These behavioral changes were viewed as important milestones because they reflected growing confidence and a willingness to engage with reading tasks that many learners had previously found intimidating.

One teacher emphasized that sustained improvement was made possible through *"continued support to reading and provision [of] reading materials,"* (P9) explaining that learners needed frequent opportunities to practice using texts that matched their current reading abilities. Another participant highlighted the importance of consistent encouragement, recommending *"regular monitoring, scaffolded materials at easier levels, and strong encouragement to build confidence and reading habits."* (P11). These accounts illustrated that confidence and competence developed together. As learners experienced success with appropriately leveled texts, they became more willing to participate in reading activities and gradually developed greater independence.

Classroom observations also showed that improvements were not limited to confidence alone. Teachers noted fewer decoding errors, smoother oral reading, broader vocabulary, and stronger comprehension during guided reading sessions. Some learners remained within the same PHIL-IRI proficiency category at the end of the intervention, yet their day-to-day classroom performance demonstrated clear academic growth. They required less prompting, read with greater fluency, and were increasingly able to discuss the meaning of texts using their own words. These changes indicated that standardized proficiency levels, while useful for monitoring overall progress, may not fully capture the incremental development that occurred as learners strengthen multiple aspects of reading simultaneously. This observation aligned with contemporary perspectives that view reading comprehension as a developmental process involving the continuous interaction of decoding, language comprehension, vocabulary, fluency, and learner motivation rather than a sequence of isolated skills [11] and [12].

Teachers likewise recognized that learners progressed at different rates. Attendance, previous reading experiences, home support, and socioeconomic conditions all influenced how quickly children developed reading proficiency. Learners who attended school regularly and had opportunities to practice reading at home generally advanced more quickly than those whose learning was interrupted by frequent absences or limited access to reading materials. For this reason, teachers believed that some learners required sustained intervention beyond the duration of the project. Some participants explained that , *"learners who remain at the frustration level need more intensive, targeted support such as explicit phonics instruction, small-group or one-on-one guided reading, and increased practice with high-frequency words and comprehension strategies."*(P6,P9,P11&P12)

Rather than viewing these learners as unsuccessful, teachers regarded their continued need for support as part of the normal process of literacy development. Several participants explained that children progress at different paces and that meaningful gains were often visible long before they were reflected in standardized assessments. Their experiences underscored the importance of monitoring everyday classroom performance alongside formal reading assessments when evaluating literacy interventions.

The evidence indicated that literacy growth was cumulative rather than categorical. Movement from the

Frustration Level to the Instructional or Independent Level represented only one indicator of progress. Equally important were the gradual improvements in decoding accuracy, reading fluency, comprehension, classroom participation, and learner confidence that occur throughout the learning process. These findings reinforced recent research suggesting that reading proficiency develops through the interaction of cognitive, linguistic, instructional, and motivational processes over time rather than through discrete stages of achievement [12] and [19]. For schools implementing literacy interventions, this highlighted the importance of recognizing and documenting incremental learner growth instead of relying solely on changes in proficiency classifications to judge program effectiveness.

3.4. Teachers Served as Designers of Differentiated Digital Literacy Instruction

One of the strongest themes that emerged from the qualitative findings was the indispensable role of teachers in the success of the Comprehensive Digital Literacy Program. Although the intervention introduced Reading A-Z and other digital resources, participants consistently emphasized that technology alone did not improve learners' reading outcomes. Rather, meaningful gains occurred because teachers thoughtfully adapted instructional strategies, selected reading materials that matched learners' abilities, and continuously adjusted instruction based on learners' progress. Their experiences reinforced the growing consensus that educational technology produces the greatest impact when it strengthens, rather than substitutes for, effective teaching [21].

Instead of delivering identical reading activities to the entire class, teachers differentiated instruction according to learners' assessed reading proficiency. They carefully selected leveled texts, modified classroom activities, and monitored learners' progress to determine when additional support or more challenging materials were needed. This flexible approach allowed struggling readers to experience early success while encouraging more proficient learners to continue developing their reading skills. Such responsive teaching reflected current evidence that differentiated instruction is most effective when teachers use ongoing assessment to guide instructional decisions and respond to learners' diverse strengths, interests, and learning needs [22] and [5].

Participants repeatedly identified explicit phonics instruction and guided reading as the instructional practices that contributed most to learners' improvement. Daily lessons emphasized letter-sound correspondence, decoding, vocabulary development, oral reading fluency, and comprehension through repeated guided practice using leveled reading materials. The teachers described *"the structured A-Z Reading Program routines, including leveled reading instruction, consistent guided practice, and the integration of digital and printed resources"* (P1,P2,P3,P4,P5,P6,P7,P8,P9,P10,P11,& P12) as among the most valuable features of the intervention and recommended that these practices became part of the school's regular literacy program. These classroom practices were consistent with evidence-based

recommendations that emphasize explicit, systematic literacy instruction supported by ongoing assessment and purposeful differentiation [23,25,26,27,28,34]. Teachers explained that learners who continued to struggle benefited from one-on-one or small-group intervention sessions that focused on their specific literacy needs. These sessions provided opportunities for immediate feedback, closer monitoring, and instruction tailored to each learner's pace of development. Some participants recommended *"daily one-on-one or small-group reading intervention focusing on phonics, decoding, and vocabulary building, along with more frequent guided reading sessions using leveled A-Z materials."* Another teacher emphasized the importance of *"intensive one-on-one diagnostic tutoring and high-frequency intervention sessions"* (P3, P6, P8, P12) for learners who remained at the frustration level despite regular classroom instruction. Their reflections highlighted the importance of sustained instructional support that addressed learners' individual learning trajectories rather than expecting all learners to progress at the same pace.

Teachers also shared how literacy instruction became more meaningful when reading was integrated across different learning areas. Reading activities were incorporated into Science, Mathematics, Araling Panlipunan, and other subjects, allowing learners to strengthen comprehension while engaging with authentic academic content. Guided reading, peer tutoring, partner reading, and small-group discussions created supportive learning environments where learners could practice reading with encouragement from both teachers and classmates. Participants believed that these collaborative experiences increased learner engagement and provided additional opportunities to apply newly acquired reading skills in meaningful contexts.

While participants appreciated the digital resources provided by the program, they consistently viewed technology as an instructional support rather than the primary driver of learner achievement. Digital and printed leveled reading materials expanded teachers' options for differentiating instruction, monitoring learner progress, and preparing classroom activities more efficiently. However, participants stressed that these resources became effective only because teachers deliberately integrated them into carefully planned literacy lessons. As one teacher observed, the success of the intervention depended not simply on access to technology but on the consistent use of guided practice, appropriate reading materials, and continuous teacher support throughout the learning process. This finding reflected recent international evidence that technology contributed most effectively to learning when it complemented teachers' professional expertise and instructional decision-making rather than functioning as a stand-alone solution [8] and [21].

Several participants likewise emphasized that sustaining the program would require continued professional learning and institutional support. They recommended maintaining access to Reading A-Z resources, strengthening school investment in literacy materials, and providing teachers with continuing professional development focused on differentiated reading instruction. These recommendations demonstrated teachers' recognition that improving literacy is an ongoing

process requiring continuous instructional refinement and collaborative learning among educators. Their perspectives were consistent with research highlighting teacher expertise as one of the strongest school-based influences on learner achievement [29] and [17].

The findings underscored that teachers were the principal agents of change throughout the intervention. Their professional judgment in selecting appropriate reading materials, adapting instruction, monitoring learner progress, and providing individualized support transformed digital resources into meaningful literacy experiences. The Comprehensive Digital Literacy Program succeeded not because technology replaced teachers, but because it strengthened teachers' capacity to deliver responsive, evidence-informed, and learner-centered literacy instruction.

3.5. Digital Technology Functioned as an Enabler Rather Than a Replacement for Effective Teaching

Teachers consistently described digital technology as an important support for literacy instruction, but none viewed it as a substitute for effective teaching. Throughout the interviews, participants emphasized that learners' progress was not driven by the Reading A-Z platform alone. Instead, they attributed the improvement in reading proficiency to the way digital resources were thoughtfully integrated into daily classroom instruction. This finding echoed UNESCO's position that technology should strengthen teaching and learning while preserving the central role of teachers and meaningful human interaction in education [21].

One of the most frequently cited benefits of the intervention was the availability of leveled reading materials that could easily be matched to learners' reading abilities. Teachers explained that the Reading A-Z platform reduced the time spent preparing instructional materials and allowed them to devote greater attention to observing learners, providing feedback, and planning targeted interventions. As one participant explained, *"the structured A-Z Reading Program routines, including leveled reading instruction, consistent guided practice, and the integration of digital and printed resources"* (P1, P3, P5, & P6) helped organize reading instruction in ways that better addressed learners' individual needs.

Participants also stressed that digital resources became effective only when accompanied by explicit instruction. Classroom activities combined the use of Reading A-Z with phonics lessons, guided reading, vocabulary development, comprehension exercises, and continuous teacher feedback. Teachers remained actively engaged throughout each lesson by modeling reading strategies, asking questions, monitoring comprehension, and providing encouragement whenever learners encountered difficulties. One teacher emphasized that *"continued support to reading and provision [of] reading materials"* (P5) was essential in helping learners develop confidence and sustain improvement in their reading abilities. These classroom experiences aligned with recommendations that digital resources should complement evidence-based literacy instruction rather than function independently [20].

Another important finding was that teachers recognized

the limits of technology in addressing the broader causes of learning poverty. Participants observed that learners experiencing chronic absenteeism, economic hardship, or limited support at home often required more intensive and sustained intervention despite having access to digital reading materials. Some participant noted that learners who continued to struggle needed *"regular monitoring, scaffolded materials at easier levels, and strong encouragement to build confidence and reading habits."* (P4, P7, P10, P12). These observations suggested that while technology expanded access to quality reading resources, learners' progress continued to depend on consistent instructional support and opportunities to practice reading in both school and home environments.

Teachers likewise highlighted the value of the additional equipment provided through the program, including laptops, television displays, printers, and laminating machines. These resources made lessons more interactive and enabled teachers to prepare durable instructional materials that could be used repeatedly throughout the school year. Participants appreciated that technology reduced routine preparation tasks, allowing them to spend more time interacting with learners and responding to individual learning needs. Their experiences reinforced evidence that technology contributes most effectively to learning when it is integrated into sound pedagogical practice rather than implemented as an end in itself [8].

Several teachers also expressed the hope that the intervention would continue beyond the duration of the project. They recommended maintaining access to Reading A-Z, expanding the availability of instructional materials, and providing continuing professional development so that teachers could further strengthen their skills in differentiated literacy instruction. These recommendations reflected a shared belief that improving literacy requires sustained institutional commitment rather than one-time technological investment.

The findings indicated that digital technology served primarily as an instructional enabler. The digital tools expanded teachers' capacity to differentiate instruction, monitor learner progress, and provide timely feedback, but they did not replace the professional expertise that guided every instructional decision. Ultimately, participants attributed learners' reading gains to the combination of effective teaching, purposeful use of digital resources, and sustained learner support. This perspective is consistent with international evidence that the educational value of technology depends on how well it is aligned with sound pedagogy and clearly defined learning goals [12] and [5].

3.6. Teacher Adaptation Sustained Program Implementation Despite Resource Constraints

Although the Comprehensive Digital Literacy Program produced encouraging improvements in learners' reading proficiency, its implementation was accompanied by several practical challenges. Teachers described working in an environment where unstable internet connectivity, limited digital devices, varying learner abilities, and the realities of teaching in a geographically isolated community often required them to modify their

instructional plans. Rather than allowing these constraints to interrupt learning, participants consistently adapted their teaching while remaining focused on the program's goal of improving learners' reading proficiency. Their experiences highlight the important role of teacher professionalism, flexibility, and instructional decision-making in sustaining educational innovations under challenging conditions [29].

One of the most frequently mentioned challenges was inconsistent internet connectivity. Because online access to the Reading A-Z platform was not always reliable, teachers prepared printed copies of leveled reading materials in advance and downloaded digital resources whenever internet access was available. This allowed reading instruction to continue even during periods of poor connectivity. A number of participant explained, *"the structured A-Z Reading Program routines, including leveled reading instruction, consistent guided practice, and the integration of digital and printed resources"*(P7,P8,P10,&P12) enabled teachers to maintain continuity in classroom instruction despite technological limitations. These adaptations demonstrated how teachers exercised professional judgment to ensure that learners continued receiving appropriate literacy instruction regardless of the availability of technology.

Teachers also described the considerable variation in learners' reading abilities as a continuing instructional challenge. While some learners progressed steadily through the leveled texts, others required additional time, repeated practice, and individualized support before demonstrating noticeable improvement. Instead of expecting all learners to advance at the same rate, teachers modified reading materials, extended guided reading sessions, and provided additional one-on-one or small-group remediation. Other participants recommended *"regular monitoring, scaffolded materials at easier levels, and strong encouragement to build confidence and reading habits"* (P 5, 6,8,11,&12) for learners who continued to experience reading difficulties. These classroom practices reflected current evidence that continuous monitoring and responsive instruction are essential components of effective literacy development because they allow teachers to adjust instruction according to learners' changing needs [12].

Participants likewise emphasized that maximizing available resources became an important part of sustaining the intervention. Laptops, television displays, printers, and laminating machines were used to prepare reusable instructional materials, display digital texts, and create engaging reading activities. Teachers appreciated these resources because they reduced preparation time and enabled them to devote greater attention to observing learners, providing immediate feedback, and planning appropriate interventions. However, participants consistently noted that these resources became valuable only when combined with purposeful teaching. Their experiences reinforced UNESCO's [21] observation that technology contributes most effectively to learning when it supports teachers' instructional practice rather than attempting to replace it.

Another theme that emerged from the interviews was the importance of collaboration among teachers. Participants regularly exchanged teaching materials,

discussed learners' progress, and shared strategies for addressing reading difficulties. These collaborative efforts enabled teachers to learn from one another's experiences and to refine instructional approaches throughout the implementation period. Such professional collaboration reflected the type of collective learning environment that [29] identified as essential for sustaining meaningful educational improvement and supporting teachers' ongoing professional growth.

Teachers further recognized that several barriers to literacy development extended beyond the classroom. Poverty, irregular attendance, and limited opportunities for reading at home continued to influence the progress of some learners despite the availability of digital resources and classroom interventions. In response, teachers maintained communication with parents, encouraged reading activities at home whenever possible, and provided additional classroom support for learners who had missed instructional time. These experiences underscore UNESCO's [13] assertion that children's learning is shaped not only by classroom instruction but also by the broader social and community environments in which they live.

The findings suggest that the success of the Comprehensive Digital Literacy Program was sustained because teachers continually adapted their instructional practices while remaining committed to the program's objectives. Their willingness to modify lessons, maximize available resources, collaborate with colleagues, and respond to learners' individual needs enabled the intervention to remain effective despite contextual constraints. Rather than weakening the implementation process, these adaptations strengthened the program by making it more responsive to the realities of the local school context. The findings further affirmed that sustainable educational improvement depends not only on access to quality instructional resources but also on teachers' professional expertise, contextual responsiveness, and commitment to supporting every learner [29] and [21].

4. Discussion

The findings of this study demonstrated that reducing learning poverty requires more than simply introducing digital technologies or implementing short-term reading interventions. Although digital resources expanded access to literacy materials, meaningful improvements in learners' reading proficiency were achieved because technology was integrated into a broader instructional approach that emphasized teacher capacity building, differentiated instruction, continuous learner assessment, structured remediation, and active participation from families and community partners. These complementary strategies created conditions that enabled learners to receive consistent academic support throughout the intervention, allowing reading skills to develop progressively rather than through isolated instructional experiences.

The substantial decline in the proportion of learners classified at the PHIL-IRI Frustration Level, together with the increase in learners reaching the Instructional and Independent Levels, indicated that the Comprehensive

Digital Literacy Program functioned as a coordinated system rather than a collection of separate activities. Reading A-Z provided teachers with a wide range of leveled reading materials, but the value of these resources depended on teachers' ability to select appropriate texts, monitor learners' progress, and modify instruction based on individual learning needs. This finding is consistent with contemporary literacy research, which emphasized that successful reading development is influenced by multiple interacting factors, including language development, learner engagement, executive functioning, instructional quality, and opportunities for meaningful practice rather than by any single instructional component alone [30].

Beyond the measurable gains in reading proficiency, the intervention strengthened teachers' instructional practices and fostered greater collaboration among schools, families, and community stakeholders. Parents became more actively involved in supporting reading activities at home, while external partners helped expand access to instructional resources and professional development opportunities. These collaborative efforts transformed literacy development from being primarily a classroom responsibility into a shared educational commitment. Such findings reflected current international perspectives that recognize learning poverty as a multidimensional challenge requiring coordinated educational responses that address teaching quality, learner support, family engagement, and equitable access to learning opportunities rather than relying solely on technological innovation or curriculum reform.

The study suggested that sustainable improvements in foundational literacy are most likely when educational interventions are implemented as interconnected systems in which teachers, learners, families, school leaders, and community organizations work toward a common goal. Technology remains an important component of this process, but its greatest contribution lies in strengthening evidence-based teaching practices and expanding opportunities for learners to engage meaningfully with reading. Within this broader educational ecosystem, digital resources serve as tools that support effective instruction rather than as substitutes for it.

4.1. Reducing Learning Poverty through an Integrated School-Community Literacy Ecosystem

One of the most significant outcomes of the intervention was the marked reduction in the number of learners classified at the PHIL-IRI Frustration Level. This improvement suggested that learning poverty could be substantially reduced even in geographically isolated and economically disadvantaged schools when literacy interventions address multiple dimensions of the learning process simultaneously. Rather than focusing on a single instructional innovation, the Comprehensive Digital Literacy Program combined teacher professional development, technology-supported instruction, differentiated reading activities, continuous learner monitoring, structured remediation, and sustained community engagement into a coordinated framework that responded to learners' diverse literacy needs.

The effectiveness of the program appeared to result from the interaction among these complementary components rather than from any one strategy in isolation. Professional development strengthened teachers' capacity to analyze learner needs and implement differentiated instruction. Reading A-Z expanded access to developmentally appropriate reading materials, enabling teachers to provide texts that matched individual reading abilities. Daily remediation sessions increased opportunities for guided practice, while ongoing progress monitoring allowed teachers to identify learning gaps and adjust instruction before difficulties became more pronounced. Parent orientation activities and community participation further reinforced literacy development by extending reading practice beyond the classroom and encouraging consistent support within learners' homes.

These findings support a systems-oriented understanding of literacy development. Reading achievement is shaped by a wide range of interconnected influences that include instructional quality, learner motivation, home literacy experiences, school leadership, teacher expertise, and access to appropriate learning resources. When these elements function together, they create learning environments that enable children to develop foundational literacy skills more effectively than interventions that address only one aspect of the educational process. Consequently, sustainable reductions in learning poverty are more likely to emerge from coordinated educational systems than from isolated initiatives targeting individual instructional components.

This interpretation is consistent with recent developments in reading research, which emphasize that reading comprehension and literacy development involve far more than decoding and language comprehension alone. Contemporary models recognize the importance of self-regulation, background knowledge, motivation, executive functioning, and active learner engagement in supporting successful reading outcomes [30]. These broader perspectives help explain why learners in the present study benefited from an intervention that simultaneously strengthened instructional practice, learner engagement, and family participation.

The findings likewise highlighted the importance of viewing schools as part of a larger educational ecosystem. Literacy development did not occur exclusively through classroom instruction but was reinforced through relationships among teachers, parents, school leaders, community volunteers, and partner organizations. These collaborative efforts increased learners' opportunities to read, receive encouragement, and practice newly acquired skills across different learning environments. Such continuity between school and home contributed to creating supportive conditions that enabled many struggling readers to make measurable progress despite persistent socioeconomic challenges.

The results suggested that reducing learning poverty requires a comprehensive school-community approach that recognizes literacy as a shared responsibility. Technology, teacher expertise, family engagement, instructional leadership, and community partnerships each contribute unique strengths; however, their greatest educational value emerges when they operate as mutually reinforcing components of a coherent literacy ecosystem.

This perspective extended beyond evaluating individual educational innovations and instead emphasized the collective capacity of schools and communities to create sustained opportunities for literacy development, particularly in underserved contexts where educational resources remain limited.

4.2. Digital Technology as an Enabler of Differentiated Literacy Instruction

One of the most significant insights emerging from this study is that digital technology contributed to literacy improvement by strengthening teachers' instructional practices rather than replacing them. While Reading A-Z provided learners with access to a broad collection of leveled reading materials, the effectiveness of these resources depended largely on how teachers integrated them into classroom instruction. Teachers selected texts that matched learners' reading abilities, designed differentiated learning activities, monitored learner progress, and modified instruction based on assessment results. This indicated that technology served as a tool that enhanced instructional decision-making rather than as an independent driver of learning.

Throughout the implementation period, teachers consistently used assessment data to identify learners' instructional needs and provide reading materials that were developmentally appropriate. Learners who were experiencing reading difficulties received texts that promoted confidence while gradually increasing reading complexity, whereas those demonstrating stronger reading skills were provided with more challenging materials that supported continued growth in fluency and comprehension. This flexible approach enabled teachers to respond more effectively to individual differences in reading development and reduced the likelihood that learners would become either frustrated by overly difficult texts or disengaged by materials that did not sufficiently challenge them.

The findings also demonstrated that technology became most effective when combined with evidence-based literacy instruction. Classroom observations showed that teachers regularly integrated digital resources with explicit phonics instruction, guided reading, vocabulary development, repeated oral reading, collaborative learning activities, comprehension questioning, and individualized remediation. These instructional practices remained central to the teaching of reading, while digital resources expanded teachers' access to appropriate instructional materials and provided greater flexibility in organizing differentiated learning experiences. Similar conclusions have been reported by [19], who argued that effective reading instruction depends not on isolated instructional approaches but on the thoughtful integration of evidence-based practices that respond to learners' diverse literacy needs.

Another important contribution of digital technology was its support for continuous learner monitoring. Because teachers had access to a wide range of leveled reading materials and accompanying instructional resources, they were able to make timely adjustments as learners demonstrated progress. Rather than waiting for periodic standardized assessments, teachers relied on

ongoing classroom observations, oral reading activities, learner performance records, and formative assessments to determine when learners were ready to transition to more challenging texts or required additional instructional support. This responsive approach allowed instruction to evolve alongside learners' developing competencies and reinforced the principle that literacy acquisition is a gradual process requiring continuous instructional adjustment.

The results further suggested that the educational value of digital technology lies less in the technology itself than in the professional expertise of the teachers who use it. Access to digital platforms alone was unlikely to improve literacy outcomes if teachers were not equipped to integrate these resources into purposeful instruction. In the present study, professional development played a critical role in enabling teachers to use Reading A-Z strategically, interpret learner assessment data, and implement differentiated instructional practices. These findings were consistent with recent international evidence indicating that technology produces meaningful improvements in learning only when it complements sound pedagogy and is supported by sustained investments in teacher capacity [22]. The report emphasized that digital technologies are most effective when they strengthen, rather than substitute for, high-quality teaching.

These findings have important implications for literacy programs implemented in resource-constrained educational settings. Investments in digital infrastructure should be accompanied by sustained professional development that equips teachers with the knowledge and skills required to integrate technology into evidence-based literacy instruction. Equally important was the establishment of continuous support systems that encouraged teachers to reflect on instructional practices, monitor learner progress, and adapt teaching strategies in response to emerging learning needs. Without these complementary supports, the educational benefits of technology were likely to remain limited regardless of the availability of digital resources.

The findings reinforced the view that technology should be understood as an instructional enabler rather than a stand-alone educational solution. Digital resources expand opportunities for differentiated instruction, facilitate continuous assessment, and provide learners with access to developmentally appropriate reading materials. However, it is the interaction between technology, teacher expertise, and evidence-based pedagogy that ultimately creates meaningful opportunities for improving foundational literacy. In this study, the success of the Comprehensive Digital Literacy Program was attributable not simply to the introduction of digital tools but to the deliberate and responsive ways in which teachers used those tools to support learners' individual pathways toward reading proficiency.

4.3. Literacy Development as a Progressive Continuum

The findings of this study indicated that literacy development is best understood as a gradual and continuous process rather than a sequence of abrupt changes between proficiency categories. Although the

Philippine Informal Reading Inventory (PHIL-IRI) provided an important benchmark for monitoring learners' reading performance, classroom evidence gathered during the intervention revealed that meaningful progress often occurred before learners moved from one proficiency level to another. Many learners demonstrated noticeable improvements in decoding accuracy, oral reading fluency, vocabulary, comprehension, and reading confidence even though their PHIL-IRI classification remained unchanged during a particular assessment period.

These observations suggested that reading development involves the steady accumulation of multiple, interconnected competencies that mature over time. Rather than progressing in a strictly linear manner, learners build foundational skills through repeated opportunities to practice, receive feedback, and apply increasingly complex reading strategies. Consequently, standardized proficiency categories may not fully capture the incremental gains that occurred during the early stages of literacy development. This interpretation was consistent with the Active View of Reading, which expands the traditional Simple View of Reading by recognizing that successful reading depends not only on word recognition and language comprehension but also on self-regulation, motivation, executive functioning, and other cognitive processes that support learners as they construct meaning from text [30].

The gradual nature of literacy development was evident throughout the implementation of the Comprehensive Digital Literacy Program. Teachers consistently reported that learners who initially struggled with decoding and oral reading became more willing to participate in reading activities, demonstrated greater confidence during guided reading sessions, and gradually improved their ability to comprehend increasingly complex texts. Although these changes were not always reflected immediately in PHIL-IRI classifications, they represented meaningful educational progress that informed subsequent instructional decisions. Such findings highlighted the importance of recognizing intermediate indicators of literacy growth rather than relying exclusively on categorical assessment outcomes.

The findings also underscored the value of continuous formative assessment in supporting literacy development. Throughout the intervention, teachers supplemented PHIL-IRI assessments with classroom observations, oral reading exercises, learner portfolios, and ongoing performance records to monitor individual progress. These multiple sources of evidence enabled teachers to identify emerging strengths and persistent learning needs, allowing instruction to be adjusted promptly in response to learners' development. Continuous monitoring also made it possible to provide timely remediation before learning difficulties became more deeply established, thereby strengthening the responsiveness of literacy instruction.

Recent scholarship likewise emphasized that effective reading instruction depends on continuous assessment and responsive teaching rather than on periodic testing alone. The Science of Reading special issue of *Reading Research Quarterly* highlighted that reading proficiency develops through the interaction of cognitive, linguistic, motivational, and instructional factors, requiring teachers to adapt instruction as learners' needs evolve over time [31]

and [30]. Likewise, [32] argued that contemporary reading research supports instructional approaches that integrate evidence from assessment with explicit teaching of foundational reading skills, language development, and comprehension processes to promote sustained literacy growth.

Viewing literacy development as a progressive continuum also provides a more balanced interpretation of the intervention's effectiveness. Learners who remained within the same PHIL-IRI category should not automatically be regarded as having made minimal progress. Many were actively strengthening the foundational competencies necessary for later advancement, suggesting that measurable improvements in reading often precede movement between standardized proficiency levels. Recognizing these incremental gains encouraged educators to maintain realistic expectations regarding the pace of literacy development while valuing the small but significant improvements that collectively contribute to long-term reading success.

These findings suggested that evaluating literacy interventions should extend beyond changes in proficiency classifications to include evidence of learners' developing competencies throughout the learning process. Improvements in fluency, vocabulary, comprehension, reading confidence, and classroom engagement represented meaningful indicators of literacy growth because they reflected the gradual acquisition of skills that support future academic achievement. Adopting this broader perspective provided a more comprehensive understanding of learner progress and reinforced the importance of sustained, responsive literacy interventions that recognize reading development as a continuous process rather than a series of isolated assessment outcomes.

4.4. Community Engagement as a Catalyst for Sustainable Literacy Improvement

An important finding of this study is that improvements in learners' reading proficiency were strengthened when responsibility for literacy development extended beyond the classroom and became a shared commitment among teachers, parents, school leaders, and community stakeholders. While classroom instruction remained the foundation of literacy learning, the intervention demonstrated that learners made more consistent progress when reading was reinforced through supportive experiences at home and within the wider community. This suggested that addressing learning poverty requires not only effective classroom practices but also collaborative learning environments that provide children with continuous opportunities to develop literacy skills across different contexts.

Parents played a central role in reinforcing literacy learning throughout the implementation of the Comprehensive Digital Literacy Program. Through orientation sessions and literacy support activities, they gained practical strategies for assisting their children with reading practice, monitoring learning progress, and establishing positive reading habits at home. As families became more actively engaged, learners benefited from additional opportunities to practice reading beyond regular

school hours, allowing classroom learning to be reinforced through everyday interactions with parents and caregivers. The continuity between school and home created a more supportive environment for literacy development and encouraged learners to read with greater confidence and consistency. These findings were consistent with the meta-analysis of [9], which found that well-designed family literacy programs significantly improve children's emergent literacy skills, particularly among learners from socioeconomically disadvantaged families. The study further emphasized that sustained parental engagement strengthens children's early literacy development by extending meaningful learning experiences beyond the formal classroom.

The intervention also highlights the value of school-community partnerships in strengthening literacy initiatives. The involvement of the Rotary Club of Cagayan de Oro Counterpoint provided digital literacy resources, instructional materials, and professional development opportunities that enhanced the school's capacity to implement and sustain the Comprehensive Digital Literacy Program. More importantly, the partnership demonstrated how civic organizations can move beyond providing material assistance to becoming active collaborators in improving educational outcomes. By working alongside teachers and school leaders, community partners helped create an environment in which literacy development became a collective responsibility rather than a task assigned solely to schools.

Community engagement likewise contributed important forms of social support that extended beyond the provision of instructional resources. Teachers consistently observed that learners who received encouragement from parents, community volunteers, and other supportive adults demonstrated greater confidence during reading activities, participated more actively in classroom discussions, and showed stronger motivation to improve their reading skills. These observations suggested that supportive relationships within learners' homes and communities create conditions that encourage sustained engagement with literacy learning. Similar findings were reported by [33], who demonstrated that both home-based and school-based parental involvement positively influenced children's reading achievement during the first years of elementary education. Their findings underscored the importance of maintaining strong partnerships between families and schools to create consistent learning experiences that support children's literacy development.

Another notable contribution of community participation was its role in strengthening the sustainability of the intervention. Literacy programs often depended on project-based funding or external support, making long-term implementation difficult once formal assistance has ended. In the present study, however, the active participation of parents, teachers, school leaders, and community organizations fostered a shared sense of ownership that increased local commitment to sustaining literacy initiatives. This collaborative approach helped build institutional capacity within the school while encouraging stakeholders to continue supporting reading activities beyond the duration of the project.

The findings were consistent with current international perspectives that view educational improvement as a

collective endeavor requiring coordinated action across multiple sectors. The UNESCO Global Education Monitoring Report 2023/24 emphasizes that educational innovations, including technology-supported learning, are most effective when they are implemented within strong educational systems characterized by capable teachers, supportive leadership, meaningful community partnerships, and equitable access to learning opportunities [21]. From this perspective, technology becomes one component of a broader ecosystem in which collaboration among schools, families, communities, and development partners creates the conditions necessary for sustainable improvements in learning.

The findings indicated that community engagement should be regarded as an essential component of comprehensive literacy interventions rather than as a supplementary activity. Sustainable reductions in learning poverty are more likely when schools, families, civic organizations, and local communities work together to support children's literacy development through coordinated and mutually reinforcing efforts. The experience of the Comprehensive Digital Literacy Program demonstrates that such partnerships not only expand access to educational resources but also strengthen learner motivation, reinforce reading practices across home and school environments, and enhance the long-term sustainability of literacy initiatives. These findings provided further evidence that lasting improvements in foundational literacy depend on collective action in which every stakeholder contributes to creating supportive environments that enable children to become confident and successful readers.

4.5. Poverty and Attendance as Persistent Constraints on Literacy Development

Despite the encouraging outcomes of the Comprehensive Digital Literacy Program, the findings also highlighted the continuing influence of socioeconomic conditions on learners' literacy development. Throughout the implementation of the intervention, teachers consistently identified chronic absenteeism, household poverty, limited access to learning resources, and competing family responsibilities as factors that constrained the progress of some learners. Although the program created meaningful opportunities for reading improvement, these realities affected learners' ability to participate consistently in literacy activities and fully benefit from the instructional support provided by the school.

Among the challenges identified, irregular school attendance emerged as a significant barrier to literacy development. Learners who were frequently absent missed guided reading sessions, differentiated instruction, and structured remediation activities that were designed to strengthen foundational reading skills. These interruptions reduced opportunities for repeated practice, timely feedback, and continuous monitoring, all of which are essential for developing reading fluency and comprehension. Because literacy develops through sustained engagement and cumulative learning experiences, inconsistent attendance often delayed learners' progress and required teachers to devote

additional time to reviewing previously taught skills before introducing new concepts.

Teachers likewise observed that poverty continued to influence learners' opportunities to practice reading beyond the classroom. Some learners had limited access to age-appropriate reading materials at home, while others faced household responsibilities or economic circumstances that reduced the time available for reading practice. In several cases, parents and caregivers expressed their willingness to support their children's learning but were constrained by work demands and limited educational resources. These findings illustrated that literacy development is shaped not only by instructional quality but also by the broader conditions in which children live and learn. Similar conclusions were reached by [9], whose meta-analysis found that children from socioeconomically disadvantaged families benefit significantly from structured family literacy programs because such interventions help compensate for limited literacy opportunities in the home environment.

The findings further suggested that learning poverty should be understood as both an educational and a social concern. While effective classroom instruction remains essential, schools alone cannot eliminate the effects of poverty, food insecurity, inadequate educational resources, and unstable home learning environments. The *State of Global Learning Poverty: 2022 Update* emphasized that foundational literacy is influenced by multiple and interconnected factors and that reducing learning poverty requires coordinated efforts that combine quality instruction with policies promoting equitable access to education, learner support, and improved school participation [34]. This broader perspective recognized that educational interventions become more effective when they are complemented by initiatives that address the structural barriers limiting children's opportunities to learn.

Although these socioeconomic constraints remained evident throughout the intervention, the findings also demonstrated that schools can substantially lessen their educational impact through comprehensive and responsive instructional support. Daily reading remediation, differentiated instruction, continuous learner monitoring, and collaboration with families and community partners enabled many struggling readers to make measurable gains despite persistent economic challenges. These findings were consistent with the work of [35], who observed that learners experiencing educational disadvantage benefit most from sustained instructional support because interruptions in learning tend to widen existing achievement gaps. The experience of the Comprehensive Digital Literacy Program similarly demonstrated that consistent, targeted interventions can help learners recover foundational skills even under challenging socioeconomic conditions.

These findings reinforced the importance of sustaining literacy initiatives while simultaneously advocating policies that address the broader inequalities affecting educational opportunity. Improving attendance, strengthening family support, expanding access to reading resources, and fostering collaboration among schools, communities, and development partners can create conditions that allow learners to participate more fully in literacy learning. The findings of this study therefore

suggested that reducing learning poverty requires an integrated response in which high-quality literacy instruction is complemented by sustained efforts to address the social and economic conditions that continue to shape children's educational experiences.

5. Theoretical and Practical Contributions

This study contributes to the growing body of literature on learning poverty, digital literacy, and educational technology by demonstrating that improvements in foundational literacy are best understood as the product of an integrated educational ecosystem rather than isolated instructional innovations. Unlike many previous studies that examined educational technology, teacher professional development, or parental involvement independently, the present investigation illustrated how these components interacted synergistically to support literacy development in geographically isolated and economically disadvantaged schools.

From a theoretical perspective, the findings extend Sociocultural Theory by illustrating how literacy develops through coordinated interactions among teachers, learners, families, community organizations, and educational leaders. The study also operationalized principles consistent with Response to Intervention through differentiated instruction, structured remediation, and continuous learner monitoring. Furthermore, the findings reinforced the Technological Pedagogical Content Knowledge (TPACK) perspective by demonstrating that technology becomes educationally meaningful only when integrated with sound pedagogy and appropriate literacy content.

Practically, the study provides educators and policymakers with an evidence-informed model for designing comprehensive literacy interventions. Rather than emphasizing technology acquisition alone, the findings suggest that investments should prioritize teacher capacity-building, differentiated instruction, learner monitoring systems, structured remediation, and sustainable community partnerships. This integrated approach offers practical guidance for schools seeking scalable strategies for reducing learning poverty under conditions of limited resources.

6. Proposed Comprehensive School-Community Digital Literacy Ecosystem (CSDLE) Framework

Drawing from the empirical findings of the present study, a Comprehensive School-Community Digital Literacy Ecosystem (CSDLE) Framework is proposed as a preliminary conceptual framework for understanding how coordinated school, family, community, instructional, technological, and assessment-related processes may contribute to reducing learning poverty in underserved educational settings. The framework is grounded in the experiences and outcomes observed in the recipient school and should therefore be regarded as a study-derived

conceptual proposition rather than an empirically validated or universally generalizable implementation model.

At the center of the framework is learner literacy development, representing the intended outcome of a coordinated and responsive educational ecosystem. Surrounding this central outcome are seven mutually reinforcing pillars:

1. Supportive Educational Leadership and Policy which provides direction, institutional support, resource mobilization, and an enabling environment for sustained literacy initiatives;
2. Teacher Professional Development that strengthens teachers' pedagogical knowledge, digital competence, and capacity to design and implement responsive literacy instruction;
3. Technology-Enabled Literacy Resources which provides learners and teachers with accessible digital tools, platforms, connectivity, and literacy resources that enrich and extend opportunities for reading and learning;
4. Differentiated Literacy Instruction that enables teachers to respond to learners' varied literacy levels, needs, learning profiles, and rates of progress through appropriate instructional strategies and materials;
5. Structured and Continuous Reading Intervention which provides systematic, sustained, and appropriately sequenced opportunities for learners to develop and strengthen foundational reading competencies;
6. Family and Community Engagement that extends literacy support beyond the classroom by encouraging families and community stakeholders to reinforce reading practices, learner participation, and educational support; and
7. Continuous Learner Assessment and Progress Monitoring which provides evidence for identifying learner needs, tracking progress, evaluating instructional responses, and informing timely adjustments to literacy interventions.

The seven pillars are not intended to operate independently. Rather, the framework conceptualizes them as interconnected and dynamically reinforcing elements of a school-community literacy ecosystem. Educational leadership and policy create the conditions for teacher development and resource provision; teachers translate available resources into differentiated and sustained literacy experiences; families and community stakeholders reinforce these practices beyond the classroom; and continuous assessment generates evidence that informs responsive instructional and programmatic decision-making. Technology functions as an enabling resource within this system rather than as an independent solution to learning poverty.

The interaction of these elements is expected to create conditions that support progressive and sustained literacy development. As learners' literacy needs are identified through assessment, instructional strategies and interventions can be adjusted accordingly. Teacher professional development supports the effective use of technology and differentiated instruction, while family and community engagement can extend and reinforce literacy practices outside school. Leadership and institutional support provide the organizational conditions

necessary for these processes to be sustained. Thus, the framework views literacy improvement not as the result of a single intervention, but as an ecosystemic process in which multiple educational and community resources interact to support learner development.

Importantly, the CSDLE Framework is preliminary and requires further empirical validation. Although its components and relationships are informed by the findings of the present study, the study did not independently test the framework as a model, nor does it establish causal relationships among its seven pillars. Consequently, the framework should not yet be interpreted as a validated implementation model or as universally applicable to all underserved educational settings. Rather, it offers a conceptual proposition derived from the evidence generated in this particular school-community intervention.

Future research may examine the applicability, coherence, and effectiveness of the framework across diverse educational contexts by testing its components and hypothesized relationships using larger and more varied samples. Mixed-methods, longitudinal, comparative, or multi-site studies may be particularly useful in determining whether the seven pillars consistently interact in ways that contribute to sustained literacy development and reductions in learning poverty. Such validation could eventually inform the refinement of the CSDLE Framework and establish its potential applicability to other geographically isolated and underserved schools in the Philippines and, potentially, comparable developing-country contexts.

In this regard, the contribution of the present study is not to claim a universally applicable model, but to offer an empirically informed conceptual starting point for understanding how school, community, instructional, technological, and assessment resources may be brought together to address learning poverty in resource-constrained educational settings.

7. Policy Implications

The findings have important implications for educational policy and literacy programming. First, literacy initiatives should move beyond technology-centered approaches and adopt comprehensive models that integrate instructional quality, teacher professional development, learner assessment, and community participation. Second, sustained investments in teacher capacity-building should accompany the provision of digital technologies to maximize their educational value. Third, partnerships among schools, local governments, higher education institutions, civic organizations, and development agencies should be strengthened to ensure the sustainability of literacy interventions. Finally, national literacy policies should recognize learning poverty as a multidimensional challenge requiring coordinated educational and social responses rather than isolated instructional reforms.

8. Limitations and Future Research

The study was conducted within a single geographically

isolated public school, which may limit the transferability of findings to other educational contexts. Quantitative analyses relied primarily on descriptive PHIL-IRI data and were not supported by learner-level inferential statistical analyses because such data were unavailable. Future research may strengthen the evidence base by incorporating longitudinal learner-level datasets, comparison schools, and quasi-experimental or experimental designs. Additional investigations may also examine the long-term sustainability of literacy gains and evaluate the applicability of the proposed CSDLE Framework across diverse educational contexts.

9. Conclusion

Learning poverty remains one of the most pressing educational challenges confronting developing countries, demanding solutions that extend beyond isolated instructional innovations. The findings of this study demonstrated that meaningful improvements in foundational literacy can be achieved when digital technologies are embedded within a coordinated school-community ecosystem characterized by teacher expertise, differentiated instruction, structured literacy intervention, continuous learner monitoring, supportive leadership, and active family and community participation.

The Alleviating Learning Poverty through a Comprehensive Digital Literacy Program produced measurable improvements in learners' reading proficiency while simultaneously strengthening instructional practice and fostering community ownership of literacy development. More importantly, the study demonstrated that sustainable literacy improvement is not driven by technology alone but by the interaction of educational, organizational, and social processes that collectively support learner success.

By proposing the Comprehensive School-Community Digital Literacy Ecosystem (CSDLE), this study offers an empirically grounded framework that extends current understandings of learning poverty and provides educators, policymakers, and development organizations with a practical model for designing integrated literacy interventions. As educational systems continue to address widening learning disparities, comprehensive school-community partnerships that strategically integrate technology with evidence-based pedagogy may provide one of the most promising pathways toward achieving equitable and sustainable literacy outcomes for all learners.

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