Literacy under siege: Evaluating scalable interventions for displaced children in conflict-affected settings

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Abstract

The global literacy crisis among conflict-affected children remains an urgent yet under-examined challenge. In countries such as Syria, Yemen, and Sudan, educational disruption caused by armed conflict and displacement severely impairs foundational literacy acquisition, reinforcing cycles of poverty, social exclusion, and long-term instability. Despite increased investment in education in emergencies, limited empirical evidence exists on the effectiveness, scalability, and sustainability of literacy interventions in crisis contexts. This study evaluates diverse literacy models through a qualitative case study of the Mrajeeb Al Fhood refugee camp in Jordan, complemented by expert interviews and secondary data from international assessments (PIRLS, PISA, TIMSS). The findings reveal that community-led literacy initiatives yield the highest learning gains but are often constrained by short-term funding and limited scalability. Digital learning platforms show potential but are hindered by access and infrastructure barriers. Trauma exposure emerges as a significant impediment to literacy development, highlighting the critical need for psychosocial support within education programs. By integrating global policy analysis with grounded fieldwork, the study provides actionable, evidence-based recommendations for developing trauma-informed, culturally responsive, and policy-aligned literacy interventions. It contributes to bridging the divide between emergency education responses and long-term national education planning for displaced learners.

Keywords: Conflict-affected children, Displaced learners, Education in emergencies, Humanitarian policy, Literacy interventions.

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1. Introduction

For children displaced by conflict, natural disasters, or political instability, literacy is not merely an academic milestone, it is a critical tool for survival, self-sufficiency, and long-term resilience. The ability to read and write is directly linked to economic mobility, legal rights, and psychosocial well-being, yet millions of crisis-affected children remain without structured literacy instruction. According to [1], over 222 million children worldwide require urgent educational support, with 78 million entirely out of school due to conflict and forced displacement. Among refugee children, only 37% have access to secondary education, leaving a vast population functionally illiterate and economically marginalized [2]. The widening literacy gap in humanitarian settings exacerbates poverty, limits workforce participation, and increases long-term dependence on humanitarian aid [3]. Yet, while education is widely recognized as a fundamental human right, literacy interventions in crisis contexts remain underdeveloped, underfunded, and inconsistently implemented.

The barriers to literacy acquisition in displacement settings are both structural and psychological. Armed conflicts disrupt foundational literacy development at critical cognitive stages, leading to permanent educational setbacks and reduced life opportunities [4]. Research indicates that conflict-affected children experience an average learning loss of three to five years, worsening global educational inequalities [3]. Displacement further fractures children's access to education, as schools are destroyed, educators are forced to flee, and refugee students lack stable learning environments [5]. Beyond logistical disruptions, the cognitive and emotional toll of trauma, manifesting in impaired memory retention, reduced concentration, and language-processing deficits, renders conventional literacy instruction ineffective for learners who have experienced extreme adversity [6].

In crisis settings, literacy must be redefined beyond conventional reading and writing skills to encompass functional, digital, and trauma-informed literacy [7]. Functional literacy enables displaced learners to navigate essential services, legal documentation, and healthcare resources, a critical necessity in refugee contexts where bureaucratic literacy directly impacts survival [1]. Digital literacy has emerged as a crucial intervention strategy, with mobile learning platforms, offline digital resources, and e-learning initiatives offering alternative education pathways in regions where formal schooling is inaccessible [8]. Trauma-informed literacy programs, incorporating storytelling, narrative therapy, and culturally responsive texts, not only facilitate language acquisition but also help children process distress, fostering psychosocial resilience alongside academic development [6]. These expanded definitions emphasize literacy as both an academic tool and a psychosocial intervention, highlighting its role in crisis recovery and long-term reintegration.

Despite the growing recognition of education as a humanitarian priority, literacy interventions in crisis-affected regions remain critically under-researched and inconsistently implemented. International development organizations such as UNICEF, UNHCR, and the World Bank have launched education-in-emergency strategies, yet few studies assess the direct impact of literacy interventions on displaced learners' reading acquisition and retention [2]. Current policies often prioritize school enrollment metrics over learning outcomes, leaving significant gaps in understanding how crisis-affected children develop literacy skills in fragmented educational environments [9]. Furthermore, research has disproportionately focused on formal schooling models, overlooking alternative, community-driven literacy interventions, such as mobile literacy programs, informal education models, and digital self-paced learning tools [7]. Additionally, the intersection of literacy and trauma remains an overlooked dimension, with limited empirical studies on how PTSD, displacement-related stress, and linguistic adaptation impact literacy development [10].

One notable exception to conventional refugee education environments is the Mrajeeb Al Fhood refugee camp in Jordan, established and managed with full support from the United Arab Emirates through the Emirates Red Crescent. Unlike many crisis settings characterized by overcrowding, insecurity, or limited infrastructure, Mrajeeb Al Fhood offers a structured, dignified, and service-rich environment. The UAE's approach prioritizes educational continuity, psychosocial well-being, and social integration, providing formal schooling, vocational training, and employment opportunities for both educators and residents. Literacy instruction is supported by dedicated teaching staff, formal salary structures, and integrated health and social services, creating a secure learning ecosystem that respects cultural values and fosters reintegration. International observers, including UNHCR and humanitarian assessments, have noted that Mrajeeb Al Fhood functions more as a humanitarian village than a temporary shelter, making it a unique site for evaluating literacy interventions under favorable conditions of governance, infrastructure, and cultural sensitivity [11-13].

This study also acknowledges the vital role of Jordan as a long-standing regional host of displaced populations and a key partner in sustaining humanitarian access and operational stability. The continued collaboration between Jordanian authorities and international actors, including the UAE, has been central to enabling structured educational responses in camps such as Mrajeeb Al Fhood.

This study seeks to fill these critical gaps by evaluating the effectiveness, adaptability, and scalability of literacy interventions in diverse conflict settings. Using a qualitative case study approach, it focuses on Mrajeeb Al Fhood refugee camp in Jordan, a structured settlement hosting displaced Syrian families. This study positions Mrajeeb Al Fhood as a localized case study, using expert interviews, literacy assessments, and comparative policy analysis to extract broader lessons applicable to crisis-affected education systems worldwide. The research integrates three interdisciplinary theoretical frameworks: Educational Resilience Theory [14] to examine how displaced children develop literacy skills despite adversity, Bronfenbrenner [15] Ecological Systems Theory to analyze how environmental factors influence literacy acquisition, and Freire [16] of the Oppressed to explore how participatory, community-led literacy programs empower learners beyond basic reading and writing, fostering critical agency and social reintegration. These theoretical models provide a holistic analytical lens, ensuring that findings address both micro-level learner experiences and macro-level policy implications.

The urgency of scalable literacy interventions has never been greater. The Russia-Ukraine war the Afghanistan refugee crisis, and protracted conflicts in Syria, Sudan, and Gaza have intensified global demand for crisis-responsive literacy

programs. While international organizations such as UNICEF and UNHCR have piloted digital and community-based literacy initiatives, empirical evaluations of these programs remain limited [4]. This study provides a comparative analysis of literacy interventions, identifying best practices, implementation challenges, and policy recommendations for humanitarian organizations, educators, and policymakers. By examining both formal and alternative literacy interventions, this research offers practical, evidence-based solutions to improve literacy outcomes in crisis settings. It aims to bridge the knowledge gap between humanitarian aid and long-term education planning, ensuring that displaced children receive not only immediate educational support but also structured, sustainable pathways toward lifelong learning.

2. Research Objectives

This study evaluates the effectiveness, scalability, and sustainability of literacy interventions in crisis-affected settings, using Mrajeeb Al Fhood refugee camp as a qualitative case study while integrating global policy comparisons. By critically assessing intervention models, displacement-related learning barriers, and policy sustainability, the study provides insights for both immediate educational needs and long-term national integration of literacy programs. Specifically, it aims to:

1. Assess the impact of literacy interventions in Mrajeeb Al Fhood refugee camp on displaced children's literacy acquisition, educational retention, and psychosocial well-being.
2. Compare the effectiveness of different literacy intervention models, including formal schooling, community-led initiatives, and digital learning platforms, in fostering literacy outcomes in crisis settings.
3. Examine how displacement, trauma, and socio-economic instability shape literacy acquisition among conflict-affected learners, drawing on Educational Resilience Theory and Ecological Systems Theory.
4. Analyze the sustainability of literacy interventions, assessing how programs transition from short-term humanitarian aid to long-term integration into national education policies in post-crisis reconstruction.
5. Develop policy recommendations for integrating trauma-sensitive, culturally responsive, and scalable literacy interventions into national and international education frameworks, ensuring that displaced learners receive structured, long-term literacy support.

This research contributes to the growing discourse on education in emergencies, ensuring that literacy interventions in crisis settings are not only effective in the short term but also sustainable within broader development policies.

2.1. Research Questions

The study is guided by the following research questions:

1. How effective are literacy interventions in Mrajeeb Al Fhood refugee camp in improving reading acquisition, educational continuity, and psychosocial resilience among displaced learners?
2. What are the comparative strengths and limitations of formal schooling, community-led literacy programs, and digital learning platforms in conflict-affected settings?
3. How do displacement, trauma exposure, and socio-economic instability influence literacy acquisition, engagement, and retention among refugee learners?
4. What are the structural barriers to scaling literacy interventions beyond humanitarian aid, and how can they be integrated into long-term national education systems?
5. How can international education policies (UNHCR, UNICEF, World Bank) better support the sustainability and institutionalization of literacy interventions in post-crisis reconstruction?

By addressing these questions, this study provides empirical insights and policy recommendations for humanitarian organizations, educators, and policymakers, ensuring that literacy interventions for displaced learners contribute to both immediate educational access and long-term national development strategies.

3. Literature Review

This section critically examines the theoretical foundations, empirical research, and global policy frameworks that inform literacy interventions in conflict-affected regions. Given the growing number of displaced learners worldwide, there is an urgent need to assess how literacy programs operate in crisis settings, their effectiveness, and their long-term implications for educational resilience. This review begins by defining literacy in crisis contexts, differentiating between types of crises that impact education, and establishing a theoretical framework for understanding literacy acquisition amid instability. It then integrates global benchmarks on literacy decline, evaluates best practices from diverse crisis-affected regions, and critically examines research gaps that remain unaddressed.

3.1. Crisis Contexts: The Education Disruptions of Armed Conflict, Displacement, and Instability

Education in emergencies varies based on the type of crisis affecting a region. Armed conflicts, such as the wars in Syria and Yemen, result in direct attacks on schools, forced displacement, and disruptions in teacher training [9]. Protracted refugee crises, such as the Rohingya displacement in Bangladesh, present long-term challenges in integrating refugee children into host-country education systems [12]. Climate-induced crises, such as the floods in Pakistan and drought in Somalia, result in temporary school closures, migration, and resource shortages, severely affecting literacy rates [8].

The scale of the crisis is unprecedented. According to the United Nations Educational [1], over 222 million children worldwide require urgent educational support due to displacement, with 78 million entirely out of school. United Nations High Commissioner for Refugees (UNHCR) [12] highlights that 40% of refugee children in low-income host countries lack access to structured literacy programs, deepening the risk of permanent educational exclusion. Without urgent intervention,

these gaps will have long-term generational consequences, as literacy deprivation directly correlates with increased dropout rates, child labor participation, and social marginalization [8].

3.2. Theoretical Foundations of Literacy Interventions in Crisis Contexts

Understanding literacy acquisition in conflict settings requires a multidimensional theoretical lens. Three key frameworks provide critical insights into how literacy programs can be adapted for crisis-affected learners.

Educational Resilience Theory Masten [14] suggests that children exposed to severe adversity can achieve positive learning outcomes when provided with protective educational interventions. In conflict settings, structured literacy programs act as resilience-building mechanisms, helping learners maintain cognitive stability amid crisis. Studies on Syrian and Rohingya refugee children demonstrate that early literacy support correlates with higher long-term educational retention and lower trauma-related stress [4].

Bronfenbrenner [15] Ecological Systems Theory provides a framework for understanding how literacy development is influenced by multiple layers of the environment. The microsystem includes parental involvement, teacher support, and immediate schooling, while the mesosystem consists of community literacy centers and temporary education programs in displacement settings. The exosystem reflects humanitarian policy interventions, such as UN-funded education initiatives, while the macrosystem includes national and international education policies that determine curriculum flexibility and resource allocation. Research from South Sudan and Lebanon demonstrates that when families, teachers, and NGOs collaborate, children show faster literacy recovery, reinforcing the need for multi-level intervention strategies [8].

Freire [16] of the Oppressed critiques literacy interventions that impose rigid, non-contextualized curricula on displaced learners. In crisis settings, literacy programs that incorporate learners' cultural narratives and lived experiences demonstrate higher engagement and retention rates than standardized foreign-language curricula [9].

3.3. Global Crisis Literacy Decline and the Urgency of Intervention

International literacy assessments further underscore the urgency of the crisis. The PIRLS [17] study found that literacy proficiency among Arabic-speaking refugee students declined by 15–20% compared to non-displaced peers. Similarly, PISA [18] revealed that refugee learners consistently score below the 10th percentile in reading comprehension, placing them at high risk of lifelong functional illiteracy. TIMSS [19] data from conflict-affected areas such as Yemen, Syria, and Sudan show a 30–40% decline in literacy and numeracy outcomes, exacerbating the humanitarian education emergency. Without immediate intervention, these gaps will have long-term generational consequences, as literacy deprivation directly correlates with increased dropout rates, child labor participation, and social marginalization [8].

Despite international efforts to address the crisis, significant gaps remain in global education policies. The United Nations agencies, such as UNICEF and UNHCR, have prioritized emergency education responses; yet, they often fail to provide long-term strategies for integrating refugee learners into national education systems [20]. The World Bank has invested in large-scale literacy initiatives in fragile states but has faced challenges in sustaining these programs beyond donor cycles. A critical gap exists in transitioning from short-term emergency responses to scalable, institutionalized literacy policies that align with national education frameworks.

3.4. Global Best Practices in Crisis Literacy Interventions

Several nations and humanitarian organizations have implemented successful literacy interventions that provide scalable models for conflict-affected regions.

Finland's National Literacy Strategy for Refugees integrates language-sensitive instruction, trauma-informed pedagogy, and hybrid learning models to support newly arrived refugee learners. By emphasizing mother-tongue instruction alongside host-country language immersion, Finland has significantly improved literacy retention rates among displaced students [21].

Norway's Digital Learning in Refugee Camps Initiative has pioneered the use of adaptive digital learning technologies to support literacy development in refugee camps. Platforms such as Kahoot! EduRefugee allows displaced learners to access personalized literacy instruction even in low-resource settings with minimal teacher availability. The program has been instrumental in bridging literacy gaps for Syrian refugee children in Jordan and Lebanon [22].

South Korea's Post-War Literacy Rebuilding Programs provide a historical case study of how structured literacy programs contribute to national recovery and economic stability. Following the Korean War, community-led literacy movements and accelerated adult education programs played a crucial role in reducing illiteracy rates from 78% in 1950 to under 5% by 1980. This model demonstrates the long-term economic benefits of prioritizing literacy reconstruction in post-conflict societies [23].

3.5. Case Studies in Literacy Interventions for Arabic-Speaking Learners

Arabic-speaking conflict-affected learners face distinct linguistic, curricular, and socio-cultural barriers to literacy acquisition, which necessitate targeted and culturally responsive interventions. Research by Yang et al. [24] highlights that Arabic literacy development is particularly vulnerable to educational disruptions, as it requires sustained instruction in complex orthographic patterns and adaptation to diglossia. Unlike alphabetic languages with direct letter-to-sound correspondence, Arabic's diglossic nature, where spoken dialects differ significantly from formal written Arabic, poses additional challenges for displaced learners who experience inconsistent schooling and fragmented literacy exposure.

The COVID-19 pandemic further exacerbated these literacy challenges, as school closures and the shift to online education disproportionately affected Arabic-speaking students. Studies conducted in the UAE, Jordan, and Egypt revealed significant literacy setbacks, primarily due to the lack of digital Arabic literacy resources and inadequate teacher training for

online instruction [25]. In contexts where access to physical books and Arabic-language digital content is already limited, such disruptions deepen long-term literacy inequalities among displaced learners. These findings underscore the urgent need for mobile-accessible, digital literacy interventions tailored specifically for Arabic-speaking refugee children.

One promising initiative addressing this challenge is Bibliothèques Sans Frontières' (Libraries Without Borders) "Ideas Box" project, which has demonstrated high literacy engagement rates among Arabic-speaking refugee children. The Ideas Box, a portable multimedia learning center, provides access to culturally relevant books, digital literacy tools, and interactive storytelling workshops, which have been successfully implemented in Syrian refugee camps in Jordan and Lebanon [26]. Evaluations of this initiative indicate that localized storytelling materials and culturally embedded content significantly enhance literacy retention and reading motivation [12].

3.6. Lessons from Other Crisis Contexts: Context-Specific Literacy Models

Context-specific literacy interventions provide valuable insights into effective, culturally responsive educational strategies for conflict-affected learners. In Jammu and Kashmir, India, a study highlights the effectiveness of life-skills-integrated literacy interventions, which are tailored to the local socio-political context [27]. These programs incorporate cultural relevance, trauma-sensitive pedagogy, and community engagement, ensuring that displaced and conflict-affected children receive not only academic support but also social-emotional resilience training. Similarly, in post-war Sri Lanka, literacy programs that integrate local storytelling traditions and oral histories have been shown to enhance reading engagement and comprehension among war-affected children [28]. These models suggest that embedding literacy instruction within culturally familiar frameworks strengthens engagement and facilitates long-term retention.

The United Arab Emirates (UAE) provides another instructive case, particularly in terms of understanding literacy determinants in linguistically diverse environments. Research by Yang et al. [24] identifies reading motivation, self-efficacy, and home literacy environments as key predictors of reading achievement among fourth-grade students in Abu Dhabi. While the UAE offers a stable educational environment, its multilingual student population faces challenges similar to those in crisis settings, including language barriers, socio-economic disparities, and unequal access to reading resources. The findings suggest that parental engagement and reading motivation strategies can improve literacy outcomes, offering insights that are particularly relevant for refugee learners who lack formal schooling structures.

Beyond school-based interventions, non-formal and digital literacy solutions have emerged as crucial alternatives in conflict settings. Mobile learning initiatives and offline digital libraries offer scalable solutions for displaced learners, especially in low-resource settings where internet access is unreliable. The Ideas Box initiative exemplifies how adaptable digital and community-driven resources can support literacy learning in unstable environments.

Despite the success of localized literacy interventions, a critical gap remains in scaling these models for broader adoption in crisis-affected education systems. The lack of formal policy integration, inconsistent funding streams, and infrastructural limitations pose major challenges to long-term sustainability. To ensure that literacy interventions are evidence-based, scalable, and responsive to diverse humanitarian contexts, further research is needed to evaluate which intervention models yield the highest literacy gains and how they can be adapted across different displacement settings.

3.7. The Economic and Social Consequences of Literacy Loss in Conflict Settings

The impact of literacy deprivation in conflict-affected regions extends far beyond educational setbacks, shaping economic stability, employment opportunities, and social cohesion. Literacy is not just a fundamental right; it is a prerequisite for economic participation, social mobility, and political stability.

The World Bank [8] reports that for each year of missed literacy education, lifetime earnings decrease by 9%, creating long-term economic dependency. The educational disruptions caused by displacement and conflict result in a reduction of workforce productivity, limiting access to skilled employment opportunities and increasing reliance on humanitarian aid. The effects are particularly pronounced in refugee populations, where literacy gaps are strongly correlated with poverty cycles and economic exclusion.

Furthermore, United Nations International Children's Emergency Fund (UNICEF) [4] highlights that illiterate refugee populations are 60% less likely to secure stable employment, exacerbating long-term socio-economic inequalities. This creates a development trap, where displaced communities struggle to reintegrate into formal economies and face continued marginalization in host countries. The economic cost of inaction is significant: countries hosting large refugee populations often lose billions in potential economic contributions due to untapped human capital [8].

Beyond economic implications, literacy loss has direct consequences for social stability and security. Research by the Organization for Economic Cooperation and Development (OECD) [29] establishes a direct link between literacy deprivation and increased social exclusion, warning that communities with severe literacy deficits experience higher rates of radicalization, recruitment into armed groups, and socio-political instability. This is particularly concerning in protracted displacement settings, where illiteracy is both a consequence and a driver of ongoing conflict.

3.8. The Urgent Need for Scalable Literacy Interventions in Crisis Contexts

These findings reinforce the critical need for robust, scalable literacy interventions in crisis settings. Failure to address literacy loss in displaced populations will have profound economic, social, and security implications, prolonging cycles of poverty, disenfranchisement, and instability. The development of culturally responsive, trauma-informed, and technology-enhanced literacy strategies is not only a humanitarian imperative but also a socio-economic necessity.

This literature review highlights the severity of the global literacy crisis in conflict-affected settings, the effectiveness of localized literacy interventions, and the long-term socio-economic consequences of literacy deprivation. Theoretical models,

including Educational Resilience Theory, Ecological Systems Theory, and Pedagogy of the Oppressed, provide essential frameworks for understanding how displaced learners acquire literacy under adversity. Global best practices from Finland, Norway, and South Korea demonstrate successful models that can inform humanitarian education policy.

Despite successful interventions at the local level, there remains an urgent need for research on scalable, sustainable literacy programs that can be implemented across diverse humanitarian contexts. This review establishes a critical foundation for evaluating crisis literacy interventions, ensuring that proposed strategies are evidence-based, adaptable, and aligned with global education policies.

3.9. Policy Implications and Sustainability of Literacy Interventions

Despite successful interventions at the local level, a critical gap remains in scaling these models for broader adoption in crisis-affected education systems. Most humanitarian literacy programs remain reliant on short-term donor funding, resulting in disruptions once aid cycles end. The lack of policy alignment with national education ministries further limits sustainability. Lessons from countries that successfully integrated post-conflict literacy rebuilding into national education policies, such as South Korea, suggest that long-term literacy recovery requires government commitment, community involvement, and sustained investment.

A critical concern in literacy interventions is the risk of aid dependency, where short-term humanitarian responses inadvertently prevent national governments from taking full ownership of education recovery [8]. A shift toward development-oriented literacy frameworks is needed, where humanitarian organizations transition from direct service provision to capacity-building strategies that empower local governments and education stakeholders.

This literature review highlights the severity of the global literacy crisis in conflict-affected settings, the effectiveness of localized literacy interventions, and the long-term socio-economic consequences of literacy deprivation. Theoretical models, including Educational Resilience Theory, Ecological Systems Theory, and Pedagogy of the Oppressed, provide essential frameworks for understanding how displaced learners acquire literacy under adversity. Global best practices from Finland, Norway, and South Korea demonstrate successful models that can inform humanitarian education policy.

However, significant gaps remain. The failure of international development agencies to transition from emergency literacy interventions to sustainable national education policies continues to impede long-term solutions. Addressing this challenge requires policy innovation that bridges the divide between humanitarian education and long-term development strategies. Future research must focus on identifying mechanisms for embedding crisis literacy programs into national education frameworks, ensuring that literacy interventions are not only effective in the short term but also contribute to long-term educational stability and economic recovery.

4. Methodology

This study employs a qualitative case study approach, integrating field-based research, comparative analysis of global best practices, and policy evaluation to examine the effectiveness and scalability of literacy interventions in conflict-affected settings. The primary case study is based on fieldwork conducted in Mrajeeb Al Fhood refugee camp in Jordan, supplemented by expert interviews and secondary data from international literacy assessments. This methodological framework ensures a rigorous, context-sensitive examination of literacy challenges and solutions for displaced learners.

4.1. This Study Integrates Three Key Methodological Components

1. Case Study-Based Fieldwork: The primary case study focuses on Mrajeeb Al Fhood refugee camp, where the researcher conducted firsthand observations, semi-structured interviews, and focus groups with displaced children, parents, teachers, and administrators. This ensures direct engagement with refugee education realities while providing depth to the analysis.
2. Comparative Analysis of Global Best Practices: To contextualize findings beyond a single location, the study examines internationally recognized literacy interventions in crisis-affected settings, including:
- Finland's Refugee Literacy Programs which emphasize mother-tongue instruction, digital literacy, and trauma-sensitive pedagogy to support displaced learners.
- Norway's Digital Learning in Refugee Camps, particularly adaptive digital platforms such as Kahoot! EduRefugee which provides personalized literacy instruction in resource-constrained environments.
- South Korea's Post-War Literacy Rebuilding Model, which provides historical insights into national-scale literacy reconstruction following conflict.
3. Policy Analysis of International Development Frameworks: The study systematically evaluates the alignment, implementation gaps, and effectiveness of global literacy policies, drawing from:
- UNHCR's Refugee Education 2030 Strategy, which outlines literacy objectives for displaced learners.
- UNESCO's Education in Emergencies Framework, assessing how international policy frameworks address literacy barriers in refugee contexts.
- The World Bank's Refugee Education and Economic Mobility Report, which links literacy with long-term socio-economic outcomes and workforce participation.

These methodological components are theoretically anchored in Bronfenbrenner's [15] Ecological Systems Theory, Educational Resilience Theory, Masten [14], and Freire's [16] of the Oppressed, ensuring a comprehensive approach to evaluating literacy interventions in displacement settings.

4.2. Study Site and Population

Primary Case Study: Mrajeeb Al Fhood Refugee Camp (Jordan)

Mrajeeb Al Fhood refugee camp was selected due to:

1. The researcher's direct access and field experience with refugee education stakeholders.
2. The presence of both formal and informal literacy programs allows for an evaluation of structured and community-driven interventions.
3. Its structured humanitarian support makes it a representative case for analyzing the strengths and limitations of refugee literacy frameworks.

4.3. Expert Interviews and Comparative Perspectives

To extend the study beyond a single-site case study, expert interviews were conducted with humanitarian educators, policymakers, and program administrators who have experience working in:

- Afghan refugee literacy programs in Pakistan, where low-resource interventions are deployed in settlement schools.
- Sudanese displaced education programs in Egypt, which emphasize community-based literacy initiatives in urban displacement contexts.
- Post-conflict literacy rebuilding in South Sudan, providing insights into national-level literacy reintegration efforts.

These perspectives help contextualize the findings from Mrajeeb Al Fhood within a broader comparative framework, ensuring that the study's conclusions have global policy relevance.

Secondary Data Analysis

To ensure that findings are benchmarked against international literacy trends, the study integrates secondary data from global literacy assessments, including:

- PIRLS (Progress in International Reading Literacy Study) – measuring primary school reading proficiency in conflict-affected regions.
- PISA (Programme for International Student Assessment) – evaluating literacy levels among displaced adolescents.
- TIMSS (Trends in International Mathematics and Science Study) – offering literacy-numeracy cross-analysis in crisis contexts.

These quantitative measures provide a comparative framework, ensuring that findings from field research align with broader global trends on literacy acquisition in emergency settings.

4.4. Justification of Sample Size and Thematic Saturation

A total of 75 participants were engaged in field interviews and observations at Mrajeeb Al Fhood, consisting of:

- 35 refugee children (aged 6–16), representing different literacy learning experiences across formal and informal settings.
- 20 parents/caregivers, assessing home literacy practices and socio-cultural attitudes toward reading.
- 15 teachers, providing pedagogical insights into the effectiveness of refugee literacy programs.
- 5 camp administrators, offering institutional perspectives on funding constraints, program sustainability, and policy implementation.

This sample size aligns with qualitative research standards for achieving thematic saturation [30], ensuring that recurring literacy intervention patterns were captured without requiring additional interviews.

The demographic breakdown is presented in Table 1.

Table 1.

Demographic Breakdown of Participants from Mrajeeb Al Fhood Refugee Camp.

Participant Group	Total (n)	Gender (% Female)	Age Range	Role in Literacy Education
Refugee Children	35	48.6%	6-16	Literacy learners in formal/informal education programs
Parents	20	55.0%	28-52	Caregivers supporting literacy development at home
Teachers	15	60.0%	25-49	Instructors involved in refugee literacy programs
Administrators	5	40.0%	30-55	Supervisors of literacy initiatives within the camp
Total	75	51.2% Female	6-55	Directly engaged in literacy education

5. Data Collection Methods

5.1. Primary Data: Semi-Structured Interviews and Observations

To ensure rich qualitative insights, the study employed semi-structured interviews and direct observations, conducted as follows:

- 35 interviews with refugee learners, exploring literacy engagement, access to books, and digital learning experiences.
- 20 interviews with parents, assessing home literacy practices, barriers to education, and parental attitudes toward reading.
- 15 interviews with teachers, examining instructional strategies, literacy challenges, and intervention effectiveness.
- 5 interviews with camp administrators, discussing funding constraints, policy implementation, and program sustainability.

5.2. Secondary Data: Literacy Assessments and Policy Reports

To contextualize the case study within broader literacy policy frameworks, the study integrates:

- Comparative analysis of global literacy strategies, drawing from Finland, Norway, and South Korea's refugee education models.
- Policy alignment assessment, evaluating how UNHCR's Refugee Education 2030 and UNESCO's Education in Emergencies Framework address literacy barriers.
- Quantitative comparisons of literacy trends, using PIRLS, PISA, and TIMSS assessments to benchmark findings from the Mrajeeb Al Fhood case study.

5.3. Ethical Considerations and Participant Anonymity

The study adheres to international ethical guidelines for research with vulnerable populations (UNHCR, UNESCO, APA standards), ensuring participant protection and data security.

- Informed Consent and Data Protection: All participants provided informed consent, with parental/guardian approval for minors.
- Anonymization Measures: Interview recordings were de-identified, using pseudonyms and anonymized transcripts.
- Secure Data Storage: All collected data was encrypted and securely stored, with access limited to the research team.

Given the sensitive nature of refugee education research, additional privacy safeguards were implemented to protect participant identities and prevent unintended socio-political risks.

By integrating empirical fieldwork, comparative best practices, and international policy analysis, this study provides a methodologically robust framework for evaluating literacy interventions in humanitarian contexts.

6. Findings

This section presents the qualitative and quantitative findings of the study, explicitly structured around the revised research questions and aligned with the theoretical frameworks of Educational Resilience Theory, Masten [14], Ecological Systems Theory, Bronfenbrenner [15], and Pedagogy of the Oppressed [16]. Findings are drawn from pre- and post-literacy assessments, semi-structured interviews, expert consultations, and secondary data from international literacy assessments (PIRLS, PISA, TIMSS). Additionally, comparative insights from global best practices provide further contextualization of literacy outcomes in displacement settings.

6.1. Effectiveness of Literacy Interventions in Crisis Contexts

To assess the effectiveness of different literacy interventions, pre- and post-intervention literacy assessments were conducted among displaced learners enrolled in formal schooling, community-based literacy programs, and digital learning platforms. The results, summarized in Table 2, reveal significant variations in literacy gains depending on the intervention model, contextual barriers, and access to resources.

Table 2.
Mean Literacy Gains Across Intervention Models N=75.

Intervention Type	Pre-Intervention Mean Score (SD)	Post-Intervention Mean Score (SD)	Mean Literacy Gain
Formal School-Based Literacy	42.1 (9.4)	58.6 (10.2)	+16.5
Community-Led Literacy Initiatives	39.8 (8.7)	64.3 (9.6)	+24.5
Digital Learning Platforms	45.3 (10.1)	66.7 (10.8)	+21.4

Note: SD = standard deviation.

Findings indicate that community-led literacy interventions yielded the highest literacy gains (+24.5 points), reinforcing Freire's [16] theory that participatory, culturally embedded literacy models are more effective in crisis settings. Learners in these programs engaged in interactive storytelling, peer-supported reading circles, and community-led literacy activities, all of which contributed to higher motivation and retention rates.

Formal school-based literacy interventions demonstrated lower gains (+16.5 points), largely due to teacher shortages, classroom overcrowding, and inconsistent access to education in displacement settings. While digital learning platforms showed promising gains (+21.4 points), their effectiveness was constrained by infrastructural limitations, such as intermittent internet connectivity, limited availability of devices, and low digital literacy among parents.

Despite measurable improvements, the literacy gains in refugee settings remain significantly below global benchmarks. PIRLS [17] reports that the average literacy improvement among non-crisis learners is +32.1 points, far exceeding even the most successful crisis interventions. This reinforces Bronfenbrenner's [15] Ecological Systems Theory, which highlights the multi-layered challenges affecting literacy development in crisis-affected environments. Structural barriers, including displacement instability, economic hardships, and psychological trauma, continue to limit literacy progress, even within well-implemented intervention models

6.2. Impact of Displacement Status, Trauma Exposure, and Socio-Economic Instability on Literacy Acquisition

A multiple regression analysis was conducted to examine how trauma exposure, socio-economic instability, and displacement duration influenced literacy acquisition. The results, summarized in Table 3, indicate that trauma exposure had the most significant negative impact on literacy gains.

Table 3.
Regression Analysis of Factors Influencing Literacy Acquisition.

Predictor Variable	**β Coefficient**	**p-Value**	**Effect Size**
Trauma Exposure (PTSD Severity)	-0.52	<0.001	Strong
Socio-Economic Instability	-0.37	<0.01	Moderate
Displacement Duration	-0.29	<0.05	Moderate
Gender	-0.04	0.31	Insignificant
Age	-0.07	0.27	Insignificant

The regression analysis confirms that trauma exposure ($\beta = -0.52$, $p < 0.001$) had the strongest negative impact on literacy acquisition. Children who had experienced severe trauma due to war, forced migration, and violence exhibited lower reading comprehension, cognitive retention difficulties, and avoidance behaviors in literacy activities. This aligns with Masten's [14] Educational Resilience Theory, which emphasizes that psychosocial factors must be addressed alongside academic instruction to ensure learning success in crisis contexts.

While gender differences were not statistically significant, qualitative interviews revealed that adolescent girls faced additional literacy barriers due to domestic labor responsibilities, early marriage risks, and restricted access to digital learning tools. This suggests that literacy programs should incorporate gender-sensitive interventions to ensure equitable learning opportunities for displaced girls.

6.3. Role of Technology and Non-Traditional Learning Environments

Educators and humanitarian workers were surveyed on the perceived effectiveness of mobile learning, self-paced digital literacy tools, and non-formal education programs. The results, presented in Table 4, indicate that non-formal education programs were rated the most effective intervention model.

Table 4.
Perceived Effectiveness of Alternative Literacy Approaches.

Intervention Type	**Highly Effective (%)**	**Moderately Effective (%)**	**Not Effective (%)**
Mobile Learning (SMS-based, App-based)	61.3	29.2	9.5
Self-Paced Digital Literacy Tools	57.4	32.1	10.5
Non-Formal Education Programs	72.8	23.5	3.7

Findings indicate that non-formal education programs were the most effective (72.8%), particularly in settings where formal schooling was inaccessible. These results are consistent with global best practices, such as Norway's refugee literacy initiatives and South Korea's post-war literacy recovery models, which emphasize community-driven, flexible learning approaches.

While mobile learning and self-paced digital literacy tools showed moderate effectiveness, their implementation was hindered by infrastructural challenges, including low device ownership, inconsistent internet access, and a lack of digital literacy among refugee families. Low-tech alternatives, such as SMS-based literacy programs, were highlighted as more feasible solutions for low-resource crisis settings.

6.4. Barriers to Implementation and Scalability of Literacy Interventions

Despite the measurable literacy gains observed across multiple intervention models, scaling crisis literacy programs remains a challenge due to systemic barriers. Interviews and focus groups identified four primary obstacles:

1. Short-Term Funding Cycles – Many humanitarian literacy programs rely on short-term donor funding, leading to frequent disruptions and difficulties in retaining trained educators.
2. Curriculum Inconsistencies – Literacy interventions lack standardization across refugee settings, making it difficult for displaced learners to transition into formal national education systems.
3. Limited Parental and Community Engagement – Displaced families often lack awareness of available literacy resources, and cultural attitudes toward literacy education vary, influencing parental support.
4. Psychosocial and Trauma Barriers – Few literacy programs integrate trauma-sensitive pedagogy, despite strong evidence that emotional well-being is critical to literacy retention.

These findings reinforce Bronfenbrenner's [15] Ecological Systems Theory, demonstrating that literacy interventions are deeply embedded within broader socio-economic and political structures. Sustainable literacy interventions must therefore extend beyond classroom instruction, integrating mental health support, community engagement, and long-term policy commitments to ensure lasting impact.

This study finds that community-driven literacy models yield the highest learning gains, while formal school-based interventions remain constrained by systemic challenges. Trauma exposure, economic instability, and displacement duration significantly hinder literacy acquisition, underscoring the urgent need for integrated psychosocial and educational interventions. While digital learning holds potential, its effectiveness is limited by technological accessibility gaps, reinforcing the necessity of low-tech, scalable literacy models in crisis settings. These findings provide critical insights for policymakers, humanitarian organizations, and educators, informing evidence-based literacy interventions that prioritize sustainability, cultural adaptability, and long-term development goals.

7. Discussion

This study presents a multidimensional evaluation of literacy interventions in crisis settings, integrating quantitative findings, qualitative narratives, and comparative policy insights to examine their effectiveness, contextual constraints, and long-term sustainability. Positioned within the theoretical frameworks of Educational Resilience Theory [14], Ecological Systems Theory [15], and [16] Pedagogy of the Oppressed, the analysis reveals how displacement, trauma, and socio-economic vulnerability converge to shape literacy development among refugee learners.

8. Literacy Modalities: Comparative Strengths and Constraints

The findings confirm that community-led literacy initiatives yield the most immediate and meaningful engagement, particularly when grounded in oral traditions, storytelling, and peer-based learning. These models resonate with learners' lived realities and sociocultural identities, enhancing motivation and cognitive retention. However, despite their effectiveness, such programs often rely on short-term humanitarian funding and operate without formal policy integration, limiting their scalability and institutional continuity.

Formal school-based interventions, while offering structure and curricular alignment, were constrained by systemic shortcomings, including teacher shortages, overcrowding, and curricula mismatched to learners' prior educational backgrounds. Refugee learners, especially in urban host settings, faced linguistic and emotional barriers that undermined the intended benefits of formal education. These challenges affirm Bronfenbrenner's assertion that learning outcomes are shaped by the interaction of individual capacities and institutional environments.

Digital literacy platforms emerged as promising yet unevenly accessible tools. In regions like Iraq and South Sudan, hybrid models combining digital and classroom-based approaches showed promise. However, in refugee camps, poor infrastructure, device scarcity, and digital illiteracy, particularly among girls due to cultural restrictions, severely constrain uptake. These findings support World Bank [8] and United Nations International Children's Emergency Fund (UNICEF) [4] recommendations for expanded investment in offline, mobile-compatible, and radio-based solutions to bridge the digital divide.

8.1. The Role of Stakeholders in Literacy Delivery

The study highlights the critical, interdependent roles of teachers, informal educators, parents, and humanitarian actors in delivering literacy instruction. In formal settings, teacher effectiveness was hampered by limited training in trauma-informed pedagogy and multilingual instruction. Community-based programs demonstrated agility by engaging local volunteers, older youth mentors, and informal educators in dynamic literacy roles, although these actors often lacked formal recognition or remuneration.

Parental involvement, frequently overlooked, proved to be a key factor in literacy retention. Where caregivers had access to learning resources and basic literacy themselves, children demonstrated more consistent reading development. This finding reinforces the value of integrated family literacy components within intervention design.

8.2. Content and Curriculum Adaptation

Culturally responsive, trauma-sensitive materials were essential to engagement and learning. Standardized, text-heavy curricula performed poorly among learners with disrupted educational histories or trauma-related attention deficits. In contrast, programs that employed narrative-based, visual, and experiential resources, particularly those incorporating survival literacy (e.g., health, legal, and procedural texts), achieved higher participation and comprehension.

In Mrajeeb Al Fhood, one of the study's focal sites, the use of contextualized materials aligned closely with learners' sociocultural realities. Incorporating oral history, visual storytelling, and bilingual instruction helped bridge linguistic gaps and accommodated PTSD-related learning impairments. These practices mirror evidence-based approaches from Finland and Norway, where trauma-informed literacy methods have been adopted within national education frameworks.

8.3. Addressing Structural Vulnerabilities

The most persistent gap across interventions was the lack of long-term follow-up to assess literacy retention and life outcomes. While short-term reading gains were documented, few programs included post-intervention mechanisms such as community reading circles, after-school programs, or re-enrollment pathways into formal education. The result is a recurring risk of literacy loss once emergency programs conclude.

The cumulative impact of trauma, economic instability, and prolonged displacement emerged as the most significant barriers to sustained literacy. Learners with high trauma exposure displayed reduced attention, avoidance behaviors, and difficulty processing abstract content, symptoms that align with Masten's [14] findings on trauma and cognitive disruption. Yet most literacy programs in the Middle East and Africa still operate without integrated psychosocial support.

Moreover, displaced learners facing economic hardship, particularly in urban settings, were frequently pushed out of education by child labor, domestic responsibilities, or lack of access to safe learning spaces. This confirms World Bank findings that economic exclusion is one of the primary drivers of educational discontinuity in crisis settings.

8.4. Gender and Educational Equity

Although literacy outcomes were not significantly differentiated by gender in the quantitative data, qualitative findings revealed major disparities in access and participation. Adolescent girls in conservative communities were disproportionately affected by early marriage, domestic workloads, and parental restrictions on digital engagement. These constraints were rarely addressed in program design, rendering many literacy interventions implicitly gender-blind.

The evidence underscores the need for gender-responsive strategies, including female-led instruction, community-based reading groups for girls, flexible scheduling, and mobile learning hubs designed to navigate socio-cultural constraints. Without such adaptations, global literacy goals will remain out of reach for large segments of displaced female learners.

8.5. The UAE's Contribution: A Scalable Humanitarian Education Model

Among the promising models examined, the UAE's efforts at Mrajeeb Al Fhood refugee camp stand out as an innovative case of state-led humanitarian education. Managed by the Emirates Red Crescent, the camp provides structured schooling, vocational opportunities, psychosocial support, and parent engagement within a safe and culturally attuned environment. Teachers are salaried, classrooms are equipped with tailored materials, and family literacy is actively supported. This integrated model reflects the UAE's broader foreign aid vision, where education is not a temporary service but a platform for empowerment and resilience. Mrajeeb Al Fhood exemplifies how national leadership and investment can transform refugee education from short-term relief into a replicable, long-term development strategy.

8.6. Pathways Forward: Strategic Recommendations

To ensure that literacy interventions in crisis contexts are both effective and enduring, the following priorities are essential:

- Institutional integration: Align programs with host-country education policies to ensure formal recognition and long-term transition pathways.
- Trauma-informed pedagogy: Embed mental health-responsive practices in all literacy instruction, including storytelling, visuals, and experiential learning.
- Low-tech accessibility: Expand offline-compatible tools (SMS, radio, print) in environments with limited connectivity or restrictive cultural norms.
- Gender-responsiveness: Design programs that proactively address gender-based barriers to access and participation, particularly for adolescent girls.
- Longitudinal tracking: Establish research mechanisms to assess the durability of literacy outcomes and their impact on life trajectories.

Sustainable literacy development in crisis settings will require moving beyond fragmented interventions toward systemic, inclusive, and trauma-informed educational strategies. When embedded within national frameworks and informed by community realities, literacy becomes more than a cognitive skill; it becomes a pathway to dignity, stability, and opportunity.

9. Conclusion

This study provides a comprehensive, evidence-based evaluation of literacy interventions in conflict-affected settings, offering critical insights into their effectiveness, challenges, and long-term sustainability. By integrating quantitative literacy assessments, qualitative narratives from educators and learners, and comparative analysis with global best practices, the research advances understanding of how displacement, trauma, socio-economic instability, and intervention models shape literacy acquisition in crisis contexts. The findings contribute to both academic discourse and policy development, ensuring that literacy programs for displaced learners are not only effective in the short term but also embedded within sustainable education frameworks.

The study addresses key research gaps by providing a case study-based analysis of literacy interventions, complemented by global comparative insights. While prior research on education in emergencies often emphasizes school enrollment and access, this study shifts the focus to literacy outcomes, offering a nuanced view of how intervention models affect displaced learners' progress. It highlights the psychological and socio-economic barriers to literacy, demonstrating the impact of trauma, financial instability, and prolonged displacement on learning. It also critically examines digital literacy in crisis education, identifying both its promise and infrastructural limitations in low-resource settings.

A core contribution of this study is its integration of theoretical frameworks to construct a robust analytical lens. Educational Resilience Theory [14] explains how protective interventions mitigate trauma and displacement effects. Ecological Systems Theory [15] illustrates how family, community, and policy contexts interact to shape learning. Pedagogy of the Oppressed [16] emphasizes participatory, community-driven models that empower marginalized learners. Together, these frameworks ground the study's academic and policy relevance.

Findings are particularly relevant for humanitarian organizations, policymakers, and educators seeking to enhance literacy responses for displaced populations. International agencies such as UNHCR, UNICEF, and the World Bank can draw on these insights to inform policy decisions, ensuring that literacy programs address both immediate needs and long-term

development. Educators and literacy specialists will benefit from evidence-based recommendations, especially in trauma-sensitive pedagogies, culturally responsive curricula, and gender-inclusive strategies. This research further contributes to the growing field of education in emergencies, providing a foundation for future empirical work on sustainable literacy interventions.

Among the most distinguished models observed in this study is that of the Mrajeeb Al Fhood refugee camp in Jordan, which is fully managed and funded by the United Arab Emirates through the Emirates Red Crescent. The camp offers more than emergency shelter; it provides structured education, psychosocial support, and employment opportunities that foster community cohesion and human dignity. Teachers receive formal training and salaries, children attend stable classrooms with culturally appropriate materials, and families benefit from integrated social services. This comprehensive approach reflects the UAE's broader humanitarian strategy, which prioritizes education and long-term development as cornerstones of regional stability. As a result, Mrajeeb Al Fhood serves not only as a successful case study for literacy interventions but also as a replicable model of state-supported educational diplomacy in humanitarian settings [11, 13].

The study underscores literacy's critical role in breaking cycles of displacement-induced exclusion, while also highlighting the challenges of sustaining effective interventions. Although community-led programs showed the highest gains, their reliance on short-term humanitarian funding undermines sustainability. The findings reinforce the need for institutional support and policy integration to move from emergency responses to lasting educational reform. Similarly, digital platforms, though promising, remain inaccessible in many contexts due to persistent infrastructure barriers. Future efforts should prioritize low-tech, mobile-compatible literacy solutions to ensure equitable access.

While gender disparities were not statistically significant, adolescent girls face added literacy barriers due to socio-cultural constraints. The study underscores the need for gender-sensitive policies that address these inequities directly. Examples from Finland, Norway, and South Korea illustrate how integrating literacy into national education strategies enhances long-term impact and adaptability.

Despite its contributions, this study acknowledges several limitations. The absence of longitudinal data restricts analysis of sustained literacy outcomes, indicating a need for future research tracking long-term impacts. Moreover, while the study spans diverse settings, further comparative research is needed to differentiate the experiences of crisis-affected and non-crisis learners, expanding insight into displacement's educational effects.

Future studies should also explore the intersection of literacy and mental health, particularly how psychosocial support embedded in literacy programs affects learning retention. Given trauma's influence on literacy acquisition, there is an urgent need to evaluate interventions that integrate mental health frameworks. In addition, research should focus on adolescent girls, especially in regions where cultural and economic factors disproportionately limit their access to education.

This study reaffirms the transformative potential of literacy education in crisis settings. When interventions are context-sensitive, trauma-informed, and community-driven, they serve as powerful tools for resilience, empowerment, and social mobility. However, long-term success depends on transitioning from short-term humanitarian efforts to nationally integrated, sustained education strategies.

The international community must advance from emergency responses to systemic solutions that guarantee every displaced child access to enduring literacy education. Investment in durable, trauma-sensitive, and gender-equitable literacy programs is essential to ensure literacy becomes a pathway to dignity, opportunity, and lifelong learning.

Moving forward, governments, global agencies, and education stakeholders must collaborate to institutionalize literacy interventions within national systems. Future research should incorporate longitudinal assessments and address gender equity, ensuring that interventions meet the diverse needs of crisis-affected learners.

By bridging research, policy, and practice, this study lays the groundwork for more transformative literacy programming. Ultimately, the success of such programs in conflict settings depends on their scalability, adaptability, and responsiveness to the lived realities of displaced learners.

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