

# Evaluating the Pedagogical Efficacy of the 3Rs (Reading, Writing, and Arithmetic) Curriculum Framework in Tanzania: A PRISMA-ScR Systematic Scoping Review of the 2014 Revised Primary Education Curriculum

Kizito Innocent Lawa

Dip.Ed., B.A.Ed., PGD-CDD, M.A., Department of Curriculum Design and Educational Materials Development, Tanzania Institute of Education (TIE), Dar es Salaam, Tanzania

## ABSTRACT

**Background:** Following the promulgation of the Education and Training Policy (ETP 2014), the Ministry of Education, Science and Technology (MoEST) through the Tanzania Institute of Education (TIE) overhauled early primary education, prioritizing foundational literacy and numeracy under the 3Rs curriculum framework (Reading, Writing, and Arithmetic / KKK: Kuroma, Kuandika, na Kuhesabu) for Standard I and II. While this policy aimed to eliminate foundational learning deficits, empirical synthesis regarding its longitudinal pedagogical efficacy, classroom execution, and structural constraints remains critical for ongoing curriculum refinement.

**Objective:** This scoping review systematically maps and evaluates peer-reviewed empirical literature, curriculum policy documents, and national assessment reports regarding the pedagogical efficacy, instructional implementation dynamics, and operational challenges of the 2014 revised 3Rs curriculum framework in Tanzanian primary schools.

**Methods:** Guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines and Arksey and O'Malley's methodological framework, systematic searches were executed across electronic databases including ERIC, Scopus, Web of Science, PubMed, Google Scholar, and African Journals Online (AJOL) for studies published between 2014 and 2026.

**Results:** From 380 identified records, 22 core empirical studies met all inclusion criteria. Synthesized findings demonstrate that while the 3Rs framework significantly improved structured phonetic awareness and basic counting competencies in urban and well-resourced schools, systemic implementation barriers persist in rural public primary schools. These barriers include large class sizes (70-100+ pupils), severe textbook-to-pupil ratio imbalances, inadequate continuous teacher professional development in early grade reading methodologies (EGRA/EGMA), and diagnostic assessment gaps.

**Conclusion & Recommendations:** The 3Rs curriculum reform established a vital structural foundation for early grade learning in Tanzania. To maximize pedagogical efficacy, strategic recommendations include institutionalizing continuous school-based teacher mentoring programs by TIE, procuring multi-

sensory early grade learning kits, expanding remedial literacy/numeracy support, and reducing pupil-teacher ratios.

**Keywords:** 3Rs Curriculum; Early Grade Literacy; Numeracy; Tanzanian Primary Education; Competence-Based Curriculum; PRISMA-ScR; Tanzania Institute of Education; Educational Policy Reform.

## **1. INTRODUCTION**

### **1.1 Global Imperatives for Foundational Early Grade Literacy and Numeracy**

Foundational literacy and numeracy form the essential bedrock for all subsequent learning, cognitive development, and human capital acquisition. Universally recognized under Sustainable Development Goal 4 (SDG 4), ensuring that all children achieve functional reading, writing, and basic arithmetic skills during early primary education is a critical mandate for sustainable national development (UNESCO, 2020; World Bank, 2021). When children fail to master these foundational skills during early primary grades (Standards I and II), they suffer compounding learning poverty that severely undermines their academic performance across upper primary, secondary, and tertiary education.

Across sub-Saharan Africa, educational policies have increasingly pivoted toward early grade learning interventions. In Tanzania, initial national assessment surveys conducted in the early 2010s (such as Uwezo assessment reports and EGRA/EGMA baseline studies) revealed alarming literacy and numeracy deficits among primary school learners, where a substantial percentage of Standard III pupils were unable to read a simple Standard II level Kiswahili story or perform basic single-digit subtraction (Uwezo, 2013; RTI International, 2014).

### **1.2 The 2014 Education and Training Policy Reform and the 3Rs Curriculum**

In direct response to these foundational learning crises, the Ministry of Education, Science and Technology (MoEST) formulated the Education and Training Policy (ETP 2014). Under the technical direction of the Tanzania Institute of Education (TIE), the lower primary curriculum was comprehensively overhauled. The traditional multi-subject approach in Standards I and II was replaced by an exclusive, competence-based focus on the 3Rs framework: Reading, Writing, and Arithmetic (in Kiswahili: Kuroma, Kuandika, na Kuhesabu - KKK) (MoEST, 2014; TIE, 2015).

The primary objective of the 3Rs curriculum was to streamline instructional time, concentrating pedagogical effort entirely on foundational communication and mathematical skills before learners transitioned to subject-based learning in Standard III. Syllabi were restructured to emphasize phonics-based reading instruction, letter formation, decodable stories, and concrete object-manipulative mathematics.

### **1.3 Theoretical Framework**

This scoping review is anchored in Vygotsky's Socio-Cultural Theory of Cognitive Development (1978) and Bruner's Constructivist Theory of Instruction (1966), specifically the Enactive-Iconic-Symbolic progression. Vygotsky's concept of the Zone of Proximal Development (ZPD) emphasizes that early literacy and numeracy acquisition require structured, adult-guided scaffolding. Bruner's instructional framework posits that young learners acquire mathematical and literacy concepts best when moving from concrete physical manipulation (enactive) to visual representations (iconic) and finally abstract symbols (symbolic).

Applied to Tanzania's 2014 3Rs curriculum, these theoretical frameworks imply that effective early grade teaching requires specialized pedagogical content knowledge, interactive learning materials, small-group guided reading, and continuous diagnostic assessment. Examining whether classroom realities reflect these theoretical requisites is central to evaluating curriculum efficacy.

#### 1.4 Rationale and Research Questions

A decade following the initial rollout of the 2014 3Rs curriculum reform in Tanzania, evaluating its empirical efficacy, operational successes, and persistent implementation barriers is vital for informing contemporary curriculum revisions (such as the 2023 Lower Primary Curriculum Reform). While individual studies have evaluated isolated aspects of the 3Rs implementation, a systematic scoping review synthesizing global and national empirical evidence under the PRISMA-ScR framework is lacking.

This scoping review is guided by three primary research questions:

1. What pedagogical and learning efficacy outcomes have been achieved since the introduction of the 2014 3Rs curriculum framework in Tanzanian primary schools?
2. What structural, material, and professional development challenges impede the effective execution of the 3Rs curriculum in early grade classrooms?
3. What policy interventions and curriculum design adaptations are required to optimize early grade literacy and numeracy outcomes in Tanzania?

## 2. METHODOLOGY

This review adhered strictly to the PRISMA-ScR guidelines (Tricco et al., 2018) and Arksey & O'Malley's (2005) five-stage methodological framework as refined by Levac et al. (2010).

### 2.1 Search Strategy and Eligibility Criteria

Comprehensive literature searches were executed across ERIC, Scopus, Web of Science, PubMed, Google Scholar, and AJOL for studies published between 2014 and 2026. Keywords and search terms combined Boolean operators: ('3Rs Curriculum' OR 'KKK Curriculum' OR 'Early Grade Reading' OR 'EGRA' OR 'EGMA' OR 'Literacy and Numeracy') AND ('Primary Education' OR 'Standard 1 and 2') AND ('Tanzania' OR 'Tanzania Institute of Education'). Inclusion criteria specified: (a) empirical qualitative, quantitative, or mixed-methods studies, or official national evaluation reports; (b) focus on the 2014 3Rs curriculum in Tanzanian primary schools; and (c) publication in English or Kiswahili.

### 2.2 Study Selection and Synthesis

The database searches identified 380 records. After removing 95 duplicates, 285 titles and abstracts were screened, leading to 52 full-text articles evaluated for eligibility. Ultimately, 22 core studies met all pre-defined criteria and were included in the synthesis. Coded data were systematically categorized into qualitative and quantitative thematic clusters using thematic analysis (Braun & Clarke, 2006).

## 3. RESULTS AND THEMATIC SYNTHESIS

### 3.1 Characteristics of Included Studies

Table 1 summarizes representative empirical studies included in the review, detailing study contexts, methodologies, and key findings regarding the 3Rs curriculum.

| Author(s) & Year             | Study Context & Methodology                          | Focus Domain                               | Primary Synthesized Findings                                                                                                                        |
|------------------------------|------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Hardman et al. (2018)        | Mixed-methods, 100 primary schools, National sample  | Classroom interaction & 3Rs pedagogy       | Showed modest increase in interactive whole-class teaching, but group work and individual diagnostic scaffolding remained rare.                     |
| Bhalalusesa et al. (2016)    | Qualitative evaluation, 15 schools, Morogoro & Pwani | Teacher preparedness for 3Rs               | Revealed teacher enthusiasm for phonics-based instruction but identified acute shortages of early grade supplementary readers.                      |
| Lawa (2023)                  | Systemic curriculum audit report, TIE Repository     | 3Rs textbook alignment & design            | Found strong alignment between TIE 3Rs textbooks and competence standards, but noted physical durability issues in rural schools.                   |
| USAID / RTI (2020)           | National EGRA/EGMA Evaluation, Tanzania              | Standard II literacy & numeracy gains      | Documented significant gains in Kiswahili letter-sound identification, but oral reading fluency and math problem-solving lagged in rural districts. |
| Kassimoto & Ndibalema (2022) | Comparative survey, 24 schools, Dodoma               | Rural-urban disparities in 3Rs performance | Highlighted stark urban-rural divides driven by class size differentials (40 pupils in private/urban vs 90+ in rural public schools).               |

## 3.2 Major Synthesized Findings

### 3.2.1 Positive Pedagogical Gains in Phonics and Basic Numeracy

The review reveals clear evidence that the 2014 curriculum reform successfully reorganized early grade instruction around systematic phonics and basic numeracy skills. Standard I and II pupils exposed to trained 3Rs teachers demonstrated marked improvements in letter-sound recognition, syllable synthesis, and single-digit addition compared to pre-2014 baselines (USAID/RTI, 2020). Focusing exclusively on reading, writing, and arithmetic provided dedicated instructional time that protected early grade classrooms from curriculum overload.

### 3.2.2 Classroom Overcrowding and Structural Deficits

Despite pedagogical gains, classroom overcrowding remains a major impediment. In rural public primary schools, Standard I and II class sizes routinely range between 70 and 120 pupils per teacher (Hardman et al., 2018; Kassimoto & Ndibalema, 2022). In such large cohorts, conducting individual oral reading assessments or providing guided math feedback is virtually impossible. Teachers frequently resort to choral chanting and rote repetition, which masks individual learning deficits.

### 3.2.3 Teacher Professional Development Gaps and In-Service Support

While initial 3Rs rollout workshops reached thousands of teachers, continuous school-based mentorship and refresher training were unevenly distributed. Many lower primary teachers lacked specialized pre-service training in early grade reading instruction (EGRA) methodologies, relying on traditional lecture techniques rather than multi-sensory, activity-based approaches (Bhalalusesa et al., 2016).

## 4. DISCUSSION

The findings demonstrate that the 2014 3Rs curriculum framework was a structurally sound and necessary policy intervention that successfully centered early primary education on foundational skills. However, its long-term pedagogical efficacy is constrained by persistent operational bottlenecks in public schools. Bridging the gap between curriculum policy design at TIE and classroom reality requires addressing physical infrastructure, material provision, and continuous teacher capacity building.

## 5. CONCLUSION AND RECOMMENDATIONS

The 2014 3Rs curriculum reform established an essential foundation for early grade education in Tanzania. To optimize its pedagogical efficacy for current and future curriculum iterations, the following strategic measures are recommended:

- 1. Continuous Teacher Capacity Development:** TIE and MoEST should institutionalize school-based, cluster-level continuous teacher professional development (CPD) modules focused on early grade reading and numeracy methodologies.
- 2. Material Provision & Multi-Sensory Kits:** Scale up national distribution of decodable readers, big books, and concrete mathematical manipulative kits specifically designed for early grade classrooms.
- 3. Infrastructure & Class Size Reduction:** Prioritize primary school classroom construction in high-density rural areas to systematically reduce Standard I and II class sizes to manageable levels (maximum 40-45 pupils).
- 4. Remedial Scaffolding Programs:** Establish structured remedial literacy and numeracy sessions for Standard II and III pupils who display learning deficits before they transition to upper primary subjects.

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