

Kenya - USING ASSESSMENT FOR LEARNING TO ENHANCE NUMERACY INSTRUCTION

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Identification

SURVEY ID NUMBER
KEN-ZAF-NEA-2024-V01

TITLE
USING ASSESSMENT FOR LEARNING TO ENHANCE NUMERACY INSTRUCTION

SUBTITLE
Numeracy Error Analysis

COUNTRY

Name	Country code
KENYA	KEN

ABSTRACT

This study though only short in a short period and few schools provides evidence that error analysis interventions can effectively improve early numeracy outcomes in Bungoma county and similar contexts across Kenya and beyond. The effect size of the intervention is comparable to already established benchmarks while addressing the contextual challenges through adaptive implementation strategies.

There were four primary conclusions that emerged from this research. First, systematic error analysis proved to be an effective pedagogical approach in improving numeracy outcomes when well implemented. Second teacher professional development in numeracy particularly in error analysis enhances instructional quality and learner outcomes by building diagnostic capabilities that inform targeted instruction compared to the normal instruction. Third, for intervention to be successful, there requires structured implementation support from the school administrators and the implementors especially in resource constrained environments where teachers may lack previous experience with error analysis or other targeted numeracy interventions. Fourth, the progression in error pattern provides valuable diagnostic information that can guide both immediate remediation and long-term instructional planning.

The findings from this study have implication for the teachers, school administrators, and informing policy directions. For the teachers, it's practical application of the error analysis into regular numeracy instructions. This can improve both diagnostic capabilities and learner outcomes as the demonstrated in the findings. For teachers to enhance their instruction and remediation they need to develop diagnostic errors which will enable them to view learners errors not as random mistakes but as sytemic challenges learners go through . Further, the teachers should focus on ensuring that learners develop conceptual understanding beyond mastering number facts and procedural accuracy which promotes deeper numeracy learning and understanding which can be transferred to new and complex tasks that builds on the basic addition and subtraction tasks.

For the school administrators (the heads of institutions and their deputies along with the Board of Management (BoM)), they should build instructional capacity to improve numeracy instruction. This can be done through provision of opportunities for ongoing professional development in numeracy pedagogy that creates foundation for sustained improvements. They should enhance and promote communities of practice and peer learning which will establish systems for collaborative error analysis and spread effective practices throughout the school.

Finally, for policies, the findings informs strategic directions. The error analysis training should be incorporated into pre-service teacher education to build the teachers capacity from the beginning in their training. Additionally, the Teacher Service Commission (TSC) should incorporate error analysis as part of the teachers professional development. Further, there needs to be provision of appropriate instructional materials that will support effective implementation across diverse settings and avoid one-size fit-all solution. Finally, the in-service teachers needs to be supported with ongoing professional development that focus on numeracy instruction which will help the teachers in maintaining and building upon their training. In conclusion, given the cumulative nature of mathematics, there needs to be deliberate investing in systematic approaches to early numeracy instruction that creates foundations for later mathematical learning.

UNIT OF ANALYSIS

The learners were the units of the analysis

Version

VERSION DATE
2025-07-31

Scope

KEYWORDS

Keyword
Error Analysis
Numeracy

Coverage

GEOGRAPHIC COVERAGE
Sirisia sub-county, Bungoma County, Kenya

Producers and sponsors

PRIMARY INVESTIGATORS

Name	Affiliation
Virginia Ngindiru	Zizi Afrique Foundation

Sampling

SAMPLING PROCEDURE

The study employed purposive sampling targeting 5 schools in Sirisia sub-county targeting 2024 grade 2 and grade 3 learners. Three waves of assessments were done. In the first wave of assessment done in October 2024, grade 2 and 3 learners were systematically sampled in each of the schools. Grade 2 learners were followed for the subsequent two assessment waves in 2025 when they transitioned to grade 3 while grade 3 assessment was not followed along after their transition to grade 4. The second assessment done in March 2025 and the third assessment done in July the same year was administered to all learners of grade 2 cohort who were present during the day of the assessment.

During the systematic sample selection of learners in the first wave of learners, stratification was done by gender.

Data collection

DATES OF DATA COLLECTION

Start	End	Cycle
2024-10-14	2024-10-17	Baseline
2025-03-24	2025-03-27	Midline
2025-07-28	2025-07-31	Endline

DATA COLLECTION MODE
Face-to-face [f2f]

Data Processing

DATA EDITING

- a) Learner were given assessment scripts where they were to solve the tasks
- b) A panel categorized the methods used and errors made by the learners if the response was not correct
- c) During the error and method categorization, there was consensus among the whole panel about the type of error and method usage
- d) Structural checking of the data was done using Stata 18

Access policy

CITATION REQUIREMENTS

Use of the dataset must be acknowledged using a citation which would include:

- the Identification of the Primary Investigator
- the title of the survey (including country, acronym and year of implementation)
- the survey reference number
- the source and date of download

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Metadata production

DDI DOCUMENT ID

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PRODUCERS

Name	Abbreviation	Affiliation	Role
Zizi Afrique Foundation	ZAF	Zizi Afrique Foundation	Documentation of the DDI
Centre for Mathematics, Science and Technology Education in Africa	CEMASTE	Centre for Mathematics, Science and Technology Education in Africa	Documentation of the DDI

DATE OF METADATA PRODUCTION

2024-10

DDI DOCUMENT VERSION

V01

Data Dictionary

Data file	Cases	Variables
error_analysis_baseline_endline_anonymized	976	37