

elom

early learning measurement tools

The ELOM-R tools: Assessing children's readiness to learn in Grade 1



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The ELOM-R tools assess language and mathematics skills central to children’s readiness to learn when they enter Grade 1. The tools are standardised tests that fairly assess children in any of South Africa’s 11 official languages (South African Sign Language excluded). The skills measured in both ELOM-R tools are aligned with the Curriculum Assessment Policy Statements (CAPS) for the Reception Year, known as Grade R, of the Foundation Phase.

There are two tools: the ELOM-R Mathematics (V1) Assessment Tool and the ELOM-R Language (V1) Assessment Tool. The tools may be used individually or together.

Development of the ELOM-R tools began in 2018. The pilot instruments were tested in 2019 on how children from different socio-economic backgrounds and languages responded to each test item. After a pause due to the Covid-19 pandemic, tool adjustments were made (the tools were then named ELOM 6&7 Mathematics and Language/Literacy Assessments), and data was collected for psychometric analysis, standardisation, and norming in 2023 and 2024.

This document outlines the intended use of the ELOM-R tools, their composition, and the outcomes of the psychometric analysis, standardisation, and norming process.

How can the ELOM-R tools be used?

The tools are intended for use by schools and researchers in studies and evaluations of numeracy or literacy education programmes delivered in Grade R and early in Grade 1. These tools are not designed for individual school readiness assessment and should never be used for this purpose. The ELOM-R tools assess whether groups or populations of children have the mathematics and language skills necessary to be ready to learn in Grade 1. The tools are intended for use with groups of at least 15 children.

Users of the ELOM-R tools can apply the test results to make recommendations on how to strengthen the Grade R education programme based on areas of weakness that show up in the findings, or they can look forward to Grade 1 by drawing attention to areas in which children may require particular support.

The outcomes of the ELOM-R assessments can inform the preschool, Grade R, and Grade 1 curriculum, quality, and training. Findings can also be used in research and evaluations, for example, to measure the effects of programmes designed to enhance learning outcomes in each skill area, and in population-level surveys – such as the Thrive by Five Index – to estimate the proportion of children who are on track for Grade 1 in each learning area.

Who can administer the ELOM-R tools?

A trained and vetted assessor or a trained professional psychometrist, such as an occupational therapist, works with a child to assess their abilities using a standard test kit over 20 minutes for language, and 40 minutes for mathematics. Even though the ELOM-R tools are administered on individual children, they are not assessing an individual child's language and mathematics skills. A group of at least 15 children is assessed in a research study.

Both ELOM-R tools have accompanying test kits and digitised standardised administration manuals in 11 South African official languages. The assessor captures test performance on a tablet and uploads the records to a server for analysis by the DataDrive2030 data team. This practice standardises administration for each language group and minimises measurement error.

What specific skills do the ELOM-R tools test?

Extensive research reveals that children perform well in the early Foundation Phase when they have the following skills:

- Emergent literacy and language skills;
- Emergent mathematics skills;
- Problem-solving skills, self-regulation, and approach to learning;
- Interpersonal skills and confidence.

The ELOM-R Language (V1) Assessment Tool measures emergent literacy and language skills, while the ELOM-R Mathematics (V1) Assessment Tool measures emergent mathematics skills.

The ELOM-R Mathematics (V1) Assessment Tool contains 18 items, also known as test questions, under the following themes: number sense and operations, shape and space, patterns, functions, algebra, and measurement. The ELOM-R Language (V1) Assessment Tool contains 8 items under the following themes: listening and speaking, reading and phonics, and writing and handwriting.

Problem-solving, self-regulation, and approach to learning are collectively referred to as executive functioning. A separate tool – the ELOM-R Executive Function Assessment Tool – is in development by DataDrive2030.

Interpersonal skills and confidence are collectively referred to as social-emotional functioning (SEF). Measures of SEF are not included in the ELOM-R tools but the ELOM suite of tools does include a Social-Emotional Functioning Rating Scale, which can be used by teachers and caregivers to rate young children's social and emotional functioning.

What did the psychometric analysis of the ELOM-R Mathematics (V1) and Language (V1) Assessments show?

The ELOM-R tools are available in all official languages (except South African Sign Language) but, thus far, eight language versions have been subjected to psychometric analysis and standardisation: English, Afrikaans, isiXhosa, isiZulu, Sesotho, Setswana, Sepedi and Tshivenda.

Psychometric analyses were undertaken during 2023 and 2024 to standardise and construct norms (a test norm represents the typical or normal behaviour within a specific population) for the ELOM-R Mathematics (V1) and Language (V1) Assessments. Analyses were also undertaken to establish whether the tools are reliable measures of children's abilities, and whether they provide fair measures of children's abilities when translated and adapted from English to other languages.

Construct validity was assessed to determine whether the test items measure one or more underlying constructs (either mathematics or language ability or subcomponents of these). Finally, item difficulty was assessed for each language version of the tests.

Analyses of the ELOM-R Language (V1) Assessment showed the test to be a reliable and consistent measure in all the languages tested. However, construct validity was not established for any language. This finding means that while the test measures abilities relevant to the Grade R curriculum, they do not group together meaningfully as would be desirable. It is very challenging to develop tests of language abilities in the range of languages as attempted here. Our results so far are likely due in part to differences in the structure and forms of the eight languages tested to date. Modification of the ELOM-R Language (V1) Assessment is required and is ongoing. As the test was found to be reliable in all languages analysed, provisional norms and expected standards of performance have been developed. These will be updated once revisions to the Language (V1) Assessment have been made and subjected to further analysis.

In contrast, analyses of the ELOM-R Mathematics (V1) Assessment showed that it is a reliable and valid unidimensional measure of children's abilities. Norms and expected standards of performance have been developed.